



SEQUENCE LISTING

COPY OF PAPERS
ORIGINALLY FILED

<110> Rosenberg, Eugene

Ron, Eliora

5 Orr, Elisha

Paitan, Yossi

<120> GENE CLUSTER

10 <130> 2290.00101

<140> 09/710,262

<141> 2000-11-10

15 <160> 20

<170> PatentIn Ver. 2.1

<210> 1

20 <211> 2392

<212> DNA

<213> Myxococcus xanthus

<400> 1

25 Val Asp Pro Ala Arg Leu Thr Arg Ala Trp Glu Gly Leu Leu Glu Arg

5

10

15

Tyr Pro Leu Leu Ala Gly Ala Ile Arg Val Glu Gly Thr Glu Pro Val

20

25

30

30

Ile Val Pro Ser Gly Gln Val Ser Ala Glu Val His Glu Val Pro Ser

35

40

45

Val Ser Asp Ser Ala Leu Val Ala Thr Leu Arg Ala Ser Ala Lys Val

35

50

55

60

Pro Phe Asp Leu Ala Cys Gly Pro Leu Ala Arg Leu His Leu Tyr Ser

sub
D1

65 70 75 80

Arg Ser Glu His Glu His Val Leu Leu Leu Cys Phe His His Leu Val

85 90 95

5

Leu Asp Gly Ala Ser Val Ala Pro Leu Leu Asp Ala Leu Arg Glu Arg

100 105 110

Tyr Ala Gly Thr Glu Ala Lys Ala Gly Leu Leu Glu Val Pro Ile Val

10 115 120 125

Ala Pro Tyr Arg Ala Ala Val Glu Trp Glu Gln Leu Ala Ile Gly Gly

130 135 140

61 15 Asp Glu Gly Arg Arg His Leu Asp Tyr Trp Arg His Val Leu Ala Thr

145 150 155 160

Pro Val Pro Pro Pro Leu Asn Leu Pro Thr Asp Arg Pro Arg Ser Ala

165 170 175

20

Thr Gly Leu Asp Ser Glu Gly Ala Thr His Ser Gln Arg Val Pro Thr

180 185 190

Glu Gln Ala Leu Arg Leu Arg Glu Phe Ala Arg Ala Gln Gln Val Ser

25 195 200 205

Leu Pro Thr Val Leu Leu Gly Leu Tyr Tyr Ala Leu Leu His Arg His

210 215 220

30 Thr Arg Gln Asp Asp Val Val Val Gly Ile Pro Thr Met Gly Arg Pro

225 230 235 240

Arg Ala Glu Leu Ala Thr Ala Ile Gly Tyr Phe Val Asn Val Met Ala

245 250 255

35

Val Arg Ala Arg Gly Leu Gly Gln His Ser Phe Gly Ser Leu Leu Arg

260 265 270

His Leu His Asp Ser Val Ile Asp Gly Leu Glu His Ala His Tyr Pro

275

280

285

5 Phe Pro Arg Val Val Lys Asp Leu Arg Leu Ser Asn Gly Pro Glu Glu

290

295

300

Ala Pro Gly Phe Gln Thr Met Phe Thr Phe Gln Ser Leu Gln Leu Thr

305

310

315

320

10

Ser Ala Pro Pro Arg Pro Glu Pro Arg Ser Gly Gly Leu Pro Glu Leu

325

330

335

C1 15 Glu Pro Leu Asp Cys Val His Gln Glu Gly Ala Tyr Pro Leu Glu Leu

340

345

350

Glu Val Val Glu Gly Ala Lys Gly Leu Thr Leu His Phe Lys Tyr Asp

355

360

365

20 Ala Arg Leu Tyr Glu Ala Asp Thr Val Glu Arg Met Ala Arg Gln Leu

370

375

380

Leu Arg Ala Ala Asp Gln Val Ala Asp Gly Val Glu Ser Pro Leu Ser

385

390

395

400

25

Ala Leu Ser Trp Leu Asp Asp Glu Glu Arg Arg Thr Leu Leu Arg Asp

405

410

415

Trp Asn Ala Thr Ala Thr Pro Phe Leu Glu Asp Leu Gly Val His Glu

30

420

425

430

Leu Phe Gln Arg Gln Ala Arg Glu Thr Pro Asp Ala Met Ala Val Ser

435

440

445

35 Tyr Glu Gly His Ser Leu Ser Tyr Gln Ala Leu Asp Thr Arg Ser Arg

450

455

460

Glu Ile Ala Ala His Leu Lys Ser Phe Gly Val Lys Pro Gly Ala Leu
465 470 475 480

Val Gly Ile Tyr Leu Asp Arg Ser Ala Glu Leu Val Ala Ala Met Leu
5 485 490 495

Gly Val Leu Ser Ala Gly Ala Ala Tyr Val Pro Leu Asp Pro Val His
500 505 510

10 Pro Glu Asp Arg Leu Arg Tyr Met Leu Glu Asp Ser Gly Val Val Val
515 520 525

Val Leu Ala Arg Gln Ala Ser Arg Asp Lys Val Ala Ala Ile Ala Gly
530 535 540

15 Ala Ser Cys Lys Val Cys Val Leu Glu Asp Val Lys Ala Gly Ala Thr
545 550 555 560

Ser Ala Pro Ala Gly Thr Ser Pro Asn Gly Leu Ala Tyr Val Ile Tyr
20 565 570 575

Thr Ser Gly Ser Thr Gly Arg Pro Lys Gly Val Met Ile Pro His Arg
580 585 590

25 Gly Val Val Asn Phe Leu Leu Cys Met Arg Arg Thr Leu Gly Leu Lys
595 600 605

Arg Thr Asp Ser Leu Leu Ala Val Thr Thr Tyr Cys Phe Asp Ile Ala
610 615 620

30 Ala Leu Glu Leu Leu Leu Pro Leu Cys Ala Gly Ala Gln Val Ile Ile
625 630 635 640

35 Ala Ser Ala Glu Thr Val Arg Asp Ala Gln Ala Leu Lys Arg Ala Leu
645 650 655

Arg Thr His Arg Pro Thr Leu Met Gln Ala Thr Pro Ala Thr Trp Thr

	660	665	670
	Leu Leu Phe Gln Ser Gly Trp Glu Asn Ala Glu Arg Val Arg Ile Leu		
	675	680	685
5	Cys Gly Gly Glu Ala Leu Pro Glu Ser Leu Lys Ala His Phe Val Arg		
	690	695	700
	Thr Ala Ser Asp Val Trp Asn Met Phe Gly Pro Thr Glu Thr Thr Ile		
10	705	710	715 720
	Trp Ser Thr Met Ala Lys Val Ser Ala Ser Arg Pro Val Thr Ile Gly		
	725	730	735
C1 15	Lys Pro Ile Asp Asn Thr Gln Val Tyr Val Leu Asp Asp Arg Met Gln		
	740	745	750
	Pro Val Pro Ile Gly Val Pro Gly Glu Leu Trp Ile Ala Gly Ala Gly		
	755	760	765
20	Val Ala Cys Gly Tyr Leu Asn Arg Pro Ala Leu Thr Ala Glu Arg Phe		
	770	775	780
	Val Ser Asn Pro Phe Thr Pro Gly Thr Thr Leu Tyr Arg Thr Gly Asp		
25	785	790	795 800
	Leu Ala Arg Trp Arg Ala Asp Gly Glu Val Glu Tyr Leu Gly Arg Leu		
	805	810	815
30	Asp His Gln Val Lys Val Arg Gly Phe Arg Ile Glu Met Gly Glu Ile		
	820	825	830
	Glu Ala Gln Leu Ala Gly His Pro Ser Val Lys Asn Cys Ala Val Val		
	835	840	845
35	Ala Lys Glu Leu Asn Gly Thr Ser Gln Leu Val Ala Tyr Cys Gln Pro		
	850	855	860

Ala Gly Thr Ser Phe Asp Glu Glu Ala Ile Arg Ala His Leu Arg Lys
865 870 875 880

5 Phe Leu Pro Asp Tyr Met Val Pro Ala His Val Phe Ala Val Asp Ala
885 890 895

Ile Pro Leu Ser Gly Asn Gly Lys Val Asp Arg Gly Gln Leu Met Ala
900 905 910

10

Arg Pro Val Val Thr Arg Arg Lys Thr Ser Ala Val His Ala Arg Ser
915 920 925

Pro Val Glu Ala Thr Leu Val Glu Leu Trp Lys Asn Val Leu Gln Val
930 935 940

15

Asn Glu Val Gly Val Glu Asp Arg Phe Phe Glu Val Gly Gly Asp Ser
945 950 955 960

20 Val Leu Ala Ala Val Leu Val Glu Glu Met Asn Arg Arg Phe Asp Thr
965 970 975

Arg Leu Ala Val Thr Asp Leu Phe Lys Tyr Val Asn Ile Arg Asp Met
980 985 990

25

Ala Arg His Met Glu Gly Ala Thr Ala Gln Ala Arg Thr Gly Ala Thr
995 1000 1005

Glu Pro Ala Arg Glu Asp Thr Ala Ser Glu Arg Asp Tyr Glu Gly Ser
30 1010 1015 1020

Leu Ala Val Ile Gly Ile Ser Cys Gln Leu Pro Gly Ala Ala Asp Pro
1025 1030 1035 1040

35 Trp Arg Phe Trp Lys Asn Leu Arg Glu Gly Arg Asp Ser Val Val Ala
1045 1050 1055

Tyr Arg His Glu Glu Leu Arg Glu Leu Gly Val Pro Glu Glu Val Leu

1060

1065

1070

Arg Asp Ser Arg Tyr Val Ala Val Arg Ser Ser Ile Glu Asp Lys Glu

5

1075

1080

1085

Cys Phe Asp Pro His Phe Phe Gly Leu Thr Ala Arg Asp Ala Ser Phe

1090

1095

1100

10

Met Asp Pro Gln Phe Arg Leu Leu Leu Met His Ala Trp Lys Ala Val

1105

1110

1115

1120

Glu Asp Ala Ala Thr Thr Pro Glu Arg Leu Gly Pro Cys Gly Val Phe

1125

1130

1135

15

Met Thr Ala Ser Asn Ser Phe Tyr His Gln Gly Ser Pro Gln Phe Pro

1140

1145

1150

Ala Asp Gly Gln Pro Val Leu Arg Thr Ala Glu Glu Tyr Val Leu Trp

20

1155

1160

1165

Val Leu Ala Gln Ala Gly Ser Ile Pro Thr Met Val Ser Tyr Lys Leu

1170

1175

1180

25

Gly Leu Lys Gly Pro Ser Leu Phe Val His Thr Asn Cys Ser Ser Ser

1185

1190

1195

1200

Leu Ser Ala Leu Tyr Val Ala Gln Gln Ala Ile Ala Ala Gly Asp Cys

1205

1210

1215

30

Gln Thr Ala Leu Val Gly Ala Ala Thr Val Phe Pro Ser Ala Asn Leu

1220

1225

1230

Gly Tyr Leu His Gln Arg Gly Leu Asn Phe Ser Ser Ala Gly Arg Val

35

1235

1240

1245

Lys Ala Phe Asp Ala Ala Ala Asp Gly Met Ile Ala Gly Glu Gly Val

1250 1255 1260

Ala Val Leu Val Val Lys Asp Ala Ala Ala Val Arg Asp Gly Asp

1265 1270 1275 1280

5

Pro Ile Tyr Cys Leu Val Arg Lys Val Gly Ile Asn Asn Asp Gly Gln

1285 1290 1295

Asp Lys Val Gly Leu Tyr Ala Pro Ser Ala Thr Gly Gln Ala Glu Val

10 1300 1305 1310

Ile Arg Arg Leu Phe Asp Arg Thr Gly Ile Asp Pro Ala Ser Ile Gly

1315 1320 1325

15 Tyr Val Glu Ala His Gly Thr Gly Thr Leu Leu Gly Asp Pro Val Glu

1330 1335 1340

Val Ser Ala Leu Ser Glu Ala Phe Arg Thr Phe Thr Asp Arg Arg Gly

1345 1350 1355 1360

20

Tyr Cys Arg Leu Gly Ser Val Lys Ser Asn Leu Gly His Leu Asp Thr

1365 1370 1375

Val Ala Gly Leu Ala Gly Leu Ile Lys Thr Ala Leu Ser Leu Arg Gln

25 1380 1385 1390

Gly Glu Val Pro Pro Thr Leu His Val Thr Gln Val Asn Pro Lys Leu

1395 1400 1405

30 Glu Leu Thr Asp Ser Pro Phe Val Ile Ala Asp Arg Leu Ala Pro Trp

1410 1415 1420

Pro Ser Leu Pro Gly Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Leu

1425 1430 1435 1440

35

Gly Gly Thr Asn Thr His Ala Ile Leu Glu His Tyr Pro Arg Asp Ser

1445 1450 1455

Arg Pro Arg Glu Arg Ser Gln Arg Ser Asn Ala Val Arg Ala Val Ala
1460 1465 1470

5 Pro Phe Ser Ala Arg Thr Leu Glu Ala Leu Lys Asp Asn Leu Arg Ala
1475 1480 1485

Leu Leu Asp Phe Leu Glu Asp Pro Ala Ser Ala Glu Val Ala Leu Ala
1490 1495 1500

10

Asp Ile Thr Tyr Thr Leu Gln Val Gly Arg Val Ala Met Pro Glu Arg
1505 1510 1515 1520

Met Val Val Thr Ala Ser Thr Arg Asp Glu Leu Val Glu Gly Leu Arg
1525 1530 1535

15

Arg Gly Ile Ala Thr Val Gly Gly Ala His Val Gly Thr Val Val Asp
1540 1545 1550

20 Thr Ser Pro Ser Val Asp Ala Asp Ala Arg Ala Val Ala Glu Ala Trp
1555 1560 1565

Ala Thr Gly Asp Ser Ile Asp Trp Asp Ser Leu His Gly Asp Val Lys
1570 1575 1580

25

Pro Ala Arg Val Ser Leu Pro Thr Tyr Gln Phe Ala Lys Glu Arg Tyr
1585 1590 1595 1600

30

Gly Leu Ser Pro Ala His Ser Val Ala Asn Ser Ser Lys Thr His Pro
1605 1610 1615

Asp Ala Gly Val Pro Leu Phe Val Pro Thr Trp Gln Pro Trp Ser Glu
1620 1625 1630

35

Gly Ala Ser Asn Ala Ser Leu Ala Leu Arg His Leu Val Val Leu Cys
1635 1640 1645

Glu Pro Leu Asp Ala Leu Gly Ala Glu Gly Ala Ser Ala Leu Ala Ser
1650 1655 1660

Thr Leu Ala Asp Arg Arg Ile Glu Val Val Arg Thr Ser Ser Pro Ser
5 1665 1670 1675 1680

Ala Arg Leu Asp Ala Arg Phe Met Ala His Ala Ser Ala Val Phe Glu
1685 1690 1695

Arg Val Lys Ala Leu Leu Ser Glu Arg Leu Thr Ala Pro Val Thr Leu
10 1700 1705 1710

Gln Val Leu Val Pro Glu Glu Arg Asp Ala Leu Ala Leu Ser Gly Leu
1715 1720 1725

C1
15 Gly Ser Leu Leu Arg Ser Val Ser Gln Glu Asn Pro Leu Val Arg Gly
1730 1735 1740

Gln Leu Ile Arg Val Gln Gly Ser Val Ser Ala Ser Ala Leu Val Asp
20 1745 1750 1755 1760

Val Leu Val Lys Ser Ala Arg Ala Gly Asp Val Thr Asp Ser Arg Tyr
1765 1770 1775

His Ala Gly Gln Leu Ser Arg Cys Glu Trp Arg Glu Ala Arg Val Ala
25 1780 1785 1790

Lys Gly Asp Ala Ser Arg Phe Trp Arg Glu Asp Gly Val Tyr Val Ile
1795 1800 1805

30 Ser Gly Gly Thr Gly Ala Leu Ala Arg Leu Phe Val Ala Glu Ile Gly
1810 1815 1820

Lys Arg Ala Thr Arg Ala Thr Val Ile Leu Val Ala Arg Ala Ser Ser
35 1825 1830 1835 1840

Ala Glu Ala Val Asp Gly Gly Asn Gly Leu Arg Val Arg His Leu Pro

	1845	1850	1855
	Val Asp Val Thr Gln Pro Asn Asp Val Asn Ala Phe Val Ala Thr Val		
	1860	1865	1870

5

Leu Arg Glu His Gly Arg Ile Asp Gly Val Ile His Ala Ala Gly Ile
1875 1880 1885

10

Arg Arg Asp Asn Tyr Leu Leu Asn Lys Pro Val Ala Glu Met Gln Ala
1890 1895 1900

Val Leu Ala Pro Lys Val Val Gly Leu Val Asn Leu Asp His Ala Thr
1905 1910 1915 1920

15

Arg Glu Leu Pro Leu Asp Phe Phe Val Thr Phe Ser Ser Leu Ala Ala
1925 1930 1935

Phe Gly Asn Ala Gly Gln Ser Asp Tyr Ala Ala Ala Asn Gly Phe Met
1940 1945 1950

20

Asp Gly Phe Ala Glu Ser Arg Ala Ala Leu Val Asn Ala Gly Gln Arg
1955 1960 1965

25

Gln Gly Arg Thr Val Ser Ile Arg Trp Pro Leu Trp Glu Asn Gly Gly
1970 1975 1980

Met Gln Leu Asp Ser Arg Ser Arg Glu Val Leu Met Gln Arg Thr Gly
1985 1990 1995 2000

30

Met Ala Ala Leu Gly Asp Glu Ala Gly Leu Gly Ala Phe Tyr Arg Ala
2005 2010 2015

Leu Glu Leu Gly Ser Pro Gly Val Ala Val Trp Thr Gly Glu Ala Gln
2020 2025 2030

35

Arg Phe Arg Glu Leu Ser Val Ser Val Ser Pro Ala Pro Pro Pro His
2035 2040 2045

Gln Val Ala Leu Asp Ala Val Val Ser Ile Thr Glu Lys Val Glu Thr
2050 2055 2060

5 Lys Leu Lys Ala Leu Phe Ser Glu Val Thr Arg Tyr Glu Glu Arg Arg
2065 2070 2075 2080

Ile Asp Ala Arg Gln Pro Met Glu Arg Tyr Gly Ile Asp Ser Ile Ile
2085 2090 2095

10

Ile Thr Gln Met Asn Gln Ala Leu Glu Gly Pro Tyr Asn Ala Leu Ser
2100 2105 2110

Lys Thr Leu Phe Phe Glu Tyr Arg Thr Leu Ala Glu Val Ser Gly Tyr
2115 2120 2125

15

Leu Ala Glu His Arg Ala Glu Glu Ser Ala Lys Trp Val Ala Ala Pro
2130 2135 2140

20 Gly Glu Asn Ser Ser Ser Val Ile Gln Glu Ala Arg Pro Pro Arg Ala
2145 2150 2155 2160

Asp Ala Thr His Arg Ala Pro Arg Ala Asp Glu Pro Ile Ala Val Ile
2165 2170 2175

25

Gly Met Ser Gly Arg Tyr Pro Gly Ala Glu Asn Leu Thr Glu Phe Trp
2180 2185 2190

Glu Arg Leu Ser Arg Gly Asp Asp Cys Ile Thr Glu Ile Pro Pro Glu
2195 2200 2205

30

Arg Trp Ser Leu Asp Gly Phe Phe Tyr Pro Asp Lys Lys His Ala Ala
2210 2215 2220

35 Ala Arg Gly Met Ser Tyr Ser Lys Trp Gly Gly Phe Leu Gly Gly Phe
2225 2230 2235 2240

C1

Ala Asp Phe Asp Pro Leu Phe Phe Asn Ile Ser Pro Arg Glu Ala Thr

2245

2250

2255

Ser Met Asp Pro Gln Glu Arg Leu Phe Leu Gln Ser Cys Trp Glu Val

5

2260

2265

2270

Leu Glu Asp Ala Gly Tyr Thr Arg Asp Ser Leu Ala Gln Arg Phe Gly

2275

2280

2285

10

Ser Ala Val Gly Val Phe Ala Gly Ile Thr Lys Thr Gly Tyr Glu Leu

2290

2295

2300

Tyr Gly Ala Glu Leu Glu Gly Arg Asp Ala Ser Val Arg Pro Tyr Thr

2305

2310

2315

2320

15

Ser Phe Ala Ser Val Ala Asn Arg Val Ser Tyr Leu Leu Asp Leu Lys

2325

2330

2335

Gly Pro Ser Met Pro Val Asp Thr Met Cys Ser Ala Ser Leu Thr Ala

20

2340

2345

2350

Val His Met Ala Cys Glu Ala Leu Gln Arg Gly Ala Cys Val Met Ala

2355

2360

2365

25

Ile Ala Gly Gly Val Asn Leu Tyr Val His Pro Ser Ser Tyr Val Ser

2370

2375

2380

Leu Ser Gly Gln Gln Met Leu Ser

2385

2390

30

<210> 2

<211> 7178

<212> DNA

35

<213> Myxococcus xanthus

<400> 2

gtcgacccgg cgaggctgac ccgggcctgg gaaggactgc tcgaacggta tccgtgtctc 60
 gctggcgcga ttgcgtcga aggcacggag ccggtcatcg tcccagtg gagggtctcc 120
 gccgaggtcc acgaggttcc atcggcttcc gattcagcac tggtggcgac cctgcgcgcc 180
 tccggaagg tgccattcga tctgcctgt ggaccgctcg ctgggtgca cctgtactcg 240
 5 cggtcggagc acgagcatgt cctgtgtgtg tgctccacc acctggtgct cgatggggca 300
 tccgtggcg cctgtcga cgccctccgg gagcgttac ccgggaccga ggcaaggcg 360
 gggctgtcg aggttccgat cgtcgtcct taccgcgcc ccgtggagt ggagcagctc 420
 gccattggag gcgatgagg acggcgccac ctgactact ggcggcacgt gttggccacg 480
 cccgttctc cgccgttga tctccaacg gaccggcctc gctccgccac ggggttgac 540
 10 tcggaggag caacgcactc gcagaggggtg cccaccgagc aagcattgc actgcgcgag 600
 ttgctcggg cacagcaagt gagcctgcc accgtctgc tgggtctta ctacgccttg 660
 ctcatcggc acacgcgcca ggacgacgtg gtggtcgga tcccacat gggcgggccc 720
 cgggcggaac tggcgacggc gattgggtac ttgtcaacg tgatggcct gcgcgcgcg 780
 ggctggggc agcactcgt cggctcgtc ctgcgccacc tccagactc ggtcatcat 840
 15 ggctggagc atgcccacta tccctccc cgagtgtga aggacctcg gctgtcgaat 900
 gggccgagg aggcgcctg ctccagacg atgtcacct tccagagct gcaactgacg 960
 agcgtccgc caaggccgga gccaggtcg ggcggttg cgagcttga gccgtcgac 1020
 tgctccatc aggaaggcg ctaccgctg gagctgaag tggtgaggg cgccaaggc 1080
 ctacgctgc attcaagta cgacgcgcg ctgtacgag cgacacggg cgaacggatg 1140
 20 gcgcgtcagt tgtgcgcgc cgcggaccag gtcgcgatg gggtgagtc tccgtgagc 1200
 gactgtcgt ggtcgacga cgaagagcg cgcacgctt tccgcactg gaatgccacg 1260
 gccacgccgt tctcgagga cctgggcgt cagagctct tccagcgga gggccgggag 1320
 acccagacg ccatggctgt gagctacgag gggcactgc tcagctatca ggcgtggat 1380
 acgcgagcc gcgagattg ggcgcacctg aagagctcg gcgtcaagc tggggcgctc 1440
 25 gtgggcatct acctggaccg gtccgcggag ctggtggcg cgatgctgg tgtgtgtcc 1500
 gctggcggg cctacgtacc cctggaccg gtgcacccg aggaccggt gcggtacatg 1560
 ctggaggaca gtggcgtgt ggtcgtcgt gccgtcagg cctcgcgga caaggtcgcc 1620
 gccattgcc gagcctctg caaggtgtg gtctggagg acgtcaaggc tggagccacg 1680
 tccgcgccg cggaacctc accgaacga ctgcctacg tcatctacac gtccgggagc 1740
 30 acgggccggc ccaaggcggt gatgattccc catcgcggg tggtaactt cctcctgtg 1800
 atgcgcagga cgctggcct gaagcgcacg gattcgtgt tggcggtcac gacgtactg 1860
 ttgacatcg cggcgctga gctctgctt ccgtgtgtg cggggcgca ggtcatcatc 1920
 gcgtcggcg agacggtcg ggtgcgcag gcgtgaagc gggcgctcg caccatcg 1980
 cccacgtga tgcaggcgac gcccgcgacc tggacactgt tgtccagtc tggctgggag 2040
 35 aacgccgagc ggggtcgaat cctctcggt ggagaagcg tccggagtc gctcaaggcc 2100
 cacttcgtc gcaccgcgag cgacgtgtg aacatgtcg gggcaccga gacgaccatc 2160
 tggtcagca tggcgaagg ctggcctcg cgtccgtca ccattgaaa gccgatcgac 2220

C₁

aacacgcagg tctacgtgct ggacgaccgg atgcagccgg tgcccatcgg tgtgccgggc 2280
 gagctgtgga ttgcggggcg gggcggtggc tgcggttacc tcaaccggcc ggcgctgacc 2340
 gccgagcgct tcgtttccaa tccgttcacg ccgggcacga cgctctaccg gacggggggac 2400
 ctggcgcgct ggcgcgctga cggtaggtt gagtacctgg ggcggctcga ccaccagggtg 2460
 5 aaggtgcgcg gcttccgcat cgagatgggg gagattgaag cgagttggc cgggcatccc 2520
 agcgtgaaga actgtgccgt ggtggccaag gagctgaacg gcacctcgca gctcgtcgcc 2580
 tactgtcagc ccgcgggaac gagcttcgat gaggaagcca tccgtgcaca cctgcggaag 2640
 ttctccccg actacatggt ccccgcgcac gtcttcgagg tggatcgat tccgtgtcg 2700
 ggcaatggca aggtggaccg gggccagctg atggccaggc cggtggtcac ccggcggaag 2760
 10 acatccgagg tcatgcccg ttcgcctgtt gaggccaccc tcgtcgagct gtggaagaac 2820
 gtgtccagg tcaacgaggt ggtgtcgag gatcgcttct tcgaagtggg gggggactcc 2880
 gtgtggccg ccgtgctggt ggaggagatg aaccggcgct tcgacacgcg gctcgccgtc 2940
 accgacctgt tcaagtacgt caataatcgc gacatggcgc gccacatgga ggcgcgacg 3000
 gcgcaagccc gtactggggc caccgagccg gctcgcgagg acaccgctc ggagcgtgac 3060
 15 tacgagggca gcctggccgt catcgccatc tctgtcagt tgcccgagc cgcgacccc 3120
 tggcgcttct ggaagaacct gcgagagggc agggacagcg tggtagcgta ccgccatgag 3180
 gaactgcgcg agctgggctg gcccgaggag gtctccgcg attcccgta cgtcgcggtc 3240
 cggtgtcca tcgaagacaa ggagtgttc gaccgcatt tctcggtct gacggcgcg 3300
 gacggtctct tcatggaccc gcagttccga ctgttctga tgcacgcctg gaaggcagtg 3360
 20 gaagacgagg cgacgagcc tgagcgctg ggaccgtgc gcttctcat gacggccagc 3420
 aacagcttct atcaccaggg ctgcccga tttctgagg acgggcagcc ggtctccgc 3480
 accgccgaag aatacgtgct gtgggtgctg gccaggcag gctccatccc gacgatggt 3540
 tctlacaagc tcggctgaa ggggcccagc ctgttcgtcc acaccaactg ctgctatcc 3600
 ctgtccgcg tgtagctggc tcagcaggcc atcgagcgg gagactgcca gacggcgctg 3660
 25 gtgggggccc ccacggtct ccttcggcg aacttgggt atctgcacca gcgggggctc 3720
 aacttccca gcgcggggcg ggtcaaggcc ttcgagcgg cggcgagcg catgattgcc 3780
 ggtgaagggt tcgccgtgct ggtggtgaag gacgcccag cggcggtgc cgatggcgac 3840
 ccaatctact gcctgtgcg gaaggtggg atcaacaacg acggccagga caaggtgggt 3900
 ttatagccc cgagcgccac cgggcaggcg gaggatcc ggcgtctgt cgaccggacc 3960
 30 ggcacgacc ctgcatgat tggctacgtc gaggccatg gcaccggaac ctgtctgggt 4020
 gacctgtcg aggtctccgc gctgagcga gccttcgga cctcaccga ccggcgcggg 4080
 tactccggc tgggtcgggt gaagtcgaac ctgggccatc tggacacagt ggctggactg 4140
 gctgggtca tcaagacggc gctgagcctg cggcagggcg aagtctccg gacgtccat 4200
 gtgaccagg tgaatccgaa gctcgagctg acggattcgc cgttcgtcat cgccgaccgt 4260
 35 ttggcgccgt ggcgtccct gccgggaccg aggcggggcg ccgtgagtg gttcgccct 4320
 ggcgggacga ataccacgc cattctgaa cactaccgc gcgactccc cccacgggag 4380
 aggagccagc ggtcgaacgc agtccgtgcg gtggctccat tctcggcgcg caccctggag 4440

C1

cggttgaagg acaacctccg cgcgctgctc gacttctgagg aggacccggc gtccgaggag 4500
 gtggcgctcg cggacatcac ctacacgttg caggtcggcc gggtcgcat gcctgagcgg 4560
 atggtggtga ctgctgac ggcgcacgaa ttggtgagg gactcgccg aggcacgcg 4620
 acggtggcg gtgcccacgt gggaacggtg gtcgatacgt caccacgcgt ggatgccgat 4680
 5 gctcgggcag ttgcggaggc gtggcgacg ggcgactcga ttgactgga ttgctgcac 4740
 ggtgacgtga agcccgcccgtgtcagcctg cccacgtatc agttcgcaa ggagcgctac 4800
 ggggtgctc ccgcgcactc cgtggcgaat tctccaaga cgcacctga cgcgggtg 4860
 ccgctctcg ttccgacctg gcagccgtg tctgaggcg cgtcaaatgc ctggtggcg 4920
 ctccggcacc tgggtgtgtg gtgcgagcct ctgatgcgc tgggggtga aggtgcctc 4980
 10 gcgctggcga gcacgctgc ggacaggcg atcgaagtgg tcaggacgtc cagcccaagt 5040
 gcgcggctg acgcgcggt catggcgcat gcctcgccg tctcgaacg cgtcaaggcg 5100
 ctgctgctg agcgtctgac cgtcctgtg acattgcagg tgctggtgcc agaggagcg 5160
 gatgcgctg cactgagtg cctggggagc ctgctcggt cgtgtcga ggagaatccg 5220
 ttgtccggg ggcagctcat ccgcgtccag ggaagcgtc ccgcatcgc gctggtggac 5280
 15 gttctggtga agtccgcgc gcgggtgac gtcaccgatt cgcggtacca cgcgggccag 5340
 cttctcgct gtgagtgcg cgaggcacgt gtcgccaagg gggacgcac ccgcttctg 5400
 cggaagacg gcgtctatg gatttcagga ggaaccggcg ccctggccc gctgtctg 5460
 gccgaaatc ggaagcgcg gacgcgggcc accgtatc tgggtccc cgcacctc 5520
 gcggaggcg tggacggtg gaacgggctg cgcgtcgcc acctcccgt ggatgtacc 5580
 20 caaccgaac acgtgaacgc cttgtcgt acggtgctg gcgaacacg gcgcatcgc 5640
 ggtgtcatc atcgggcgg catccgcgt gacaactacc tgctcaaca gccggtggcg 5700
 gaaatgcagg cgtgtcgc gcccaagggt gtggggctc tcaacctga ccacgccacc 5760
 cgcgagctc ccctggatt cttctcacg ttctgtccc tggccggt tggaaacgc 5820
 ggtcagtcg actacggcg ggccaatgg tcatggacg gattcgcgga gtccgagcg 5880
 25 gcgctcgtga acgcccgaac gcggcagggc cggacggtg ccatccgtg gccgctctg 5940
 gagaacggcg ggatgcagct cgactcacg agccgtgagg tctgatgca gcggaccggg 6000
 atggccgcg tgggagacga agcgggactg gggcggtct accgggcgct ggaactggc 6060
 tcccctggtg tgcggtgtg gacgggggag gccagaggt tctgtaact ctccgtgag 6120
 gttcgccc caccgctcc gcatcagggt gcgtggacg ccgtggtg catcaccgag 6180
 30 aaggtcgaga cgaagctga ggcgctctc agcgaggtca cgcgatacga agagcgccg 6240
 atgatgcc gccagccgat ggagcgctat ggcacgact ccatcatcat cagcagatg 6300
 aaccaagccc tgaagggcc gtacaacgc ctctgaaga cgtgttct cgaataccg 6360
 acgctcgcg aagtcagcg gtatctggc gagcaccgc cggaagagag cggaagtgg 6420
 gtggcgccac ctggagagaa ttctcttc gcatccagg aggccaggcc gccacgtgc 6480
 35 gatgcgacg accgggcgc tcgcgccgac gagccatcg ccgtattg catgagcgc 6540
 cgttatccc gggcgagaa cctgacggag ttctgggag ccctgagcc cgtgacgac 6600
 tgcatcacc agattccgc agagcgctg tcttggacg ggttctcta cccggacaag 6660

C1

aagcacgccg ccgcgcgggg gatgagctac agcaagtggg gcggcttcct cggcggcttc 6720
gctgacttcg acccgctgtt cttcaacatc tcgccgcgtg aggcgacgag catggaccgc 6780
caggagcgct tgttcctgca gagctgctgg gaggtcctgg aggacgcggg gtacaccgcg 6840
gacagcctgg ccagcgcctt tggcagcgcg gtgggcgttt tcgcgggaat cacgaagacg 6900
5 ggctacgaac tctacggcgc ggagctggaa ggacgagatg cctcgggccg gccctatacg 6960
tcgtttgcgt ctgttgccaa ccgcgtctcg tatctgctcg acctgaaggg gccgagcatg 7020
cccgtggaca ccatgtgctc ggctcgtcgc acagccgtcc acatggcttg cgaggcgctg 7080
caacgaggcg cctgcgtcat ggccatcgcg ggtggagtga atctctacgt ccaccgcgtg 7140
agctacgtca gcctgtccgg gcagcagatg ctgtcgac 7178

10

<210> 3

<211> 785

<212> DNA

15 <213> Myxococcus xanthus

<400> 3

Met Lys Val Val Asn Lys Leu Leu Glu Lys Leu Pro Asp Val Val Ala

1 5 10 15

20

Gly Lys Val Pro Asp Val Lys Leu Gln Asp Gln Asp Ile Lys Val Pro

20 25 30

Leu Ala Gln Gly Thr Phe Thr Glu Glu Lys Ile Leu Pro Pro Lys Leu

25 35 40 45

Ala Met His Gly Phe Thr Leu Ser Phe Glu Ala Thr Gly Glu Ala Ser

50 55 60

30 Ile Arg Asn Phe Asn Ser Leu Gly Asp Val Asp Glu Asn Gly Ile Ile

65 70 75 80

Gly Glu Pro Ser Pro Glu Ser Ala Glu Pro Gly Pro Arg Pro Gln Leu

85 90 95

35

Leu Leu Gly Ser Asp Ile Gly Trp Met Arg Tyr Gln Val Ser Ala Arg

100 105 110

C1

Val Lys Ala Ala Val Ser Ala Ser Leu Ser Phe Leu Ala Ser Glu Asn

115

120

125

5 Gln Thr Glu Leu Ser Val Thr Leu Ser Asp Tyr Arg Ala His Pro Leu

130

135

140

Gly Gln Asn Met Arg Glu Ala Val Arg Ser Asp Leu Ser Glu Leu Arg

145

150

155

160

10

Leu Met Gln Ala Thr Asp Leu Ala Lys Leu Thr Thr Gly Asp Ala Val

165

170

175

Ala Trp His Val Arg Gly Ala Leu His Thr Arg Leu Glu Leu Asn Trp

15

180

185

190

Ala Asp Ile Phe Pro Thr Asn Leu Asn Arg Leu Gly Phe Leu Arg Gly

195

200

205

20 Asn Glu Leu Leu Ala Leu Lys Thr Ser Ala Lys Ala Gly Leu Ser Ala

210

215

220

Arg Val Ser Leu Thr Asp Asp Tyr Gln Leu Ser Phe Ser Arg Pro Arg

225

230

235

240

25

Ala Gly Arg Ile Gln Val Ala Val Arg Lys Val Lys Ser His Glu Gln

245

250

255

Ala Leu Ser Ala Gly Leu Gly Ile Thr Val Glu Leu Leu Asp Pro Ala

30

260

265

270

Thr Val Lys Ala Gln Leu Gly Gln Leu Leu Glu Ala Leu Leu Gly Pro

275

280

285

35 Val Leu Arg Asp Leu Val Lys Lys Gly Thr Thr Ala Val Glu Ile Met

290

295

300

C1

Asp Gly Leu Val Asp Lys Ala Ser Lys Ala Lys Leu Asp Asp Asn Gln

305 310 315 320

Lys Lys Val Leu Gly Leu Val Leu Glu Arg Leu Gly Ile Asp Pro Gln

5 325 330 335

Leu Ala Asp Pro Ala Asn Leu Pro Gln Ala Trp Ala Asp Phe Lys Ala

340 345 350

10 Arg Val Ala Glu Ser Leu Glu Asn Ala Val Arg Thr Gln Val Ala Glu

355 360 365

Gly Phe Glu Tyr Glu Tyr Leu Arg Leu Ser Glu Thr Ser Thr Leu Leu

370 375 380

15

Glu Val Val Val Glu Asp Val Thr Ala Met Arg Phe His Glu Ser Leu

385 390 395 400

Leu Lys Gly Asn Leu Val Glu Leu Leu Lys Trp Met Lys Ser Leu Pro

20 405 410 415

Ala Gln Gln Ser Glu Phe Glu Leu Arg Asn Tyr Leu His Ala Thr Thr

420 425 430

25 Leu Thr Arg Gln Gln Ala Ile Gly Phe Ser Leu Gly Leu Gly Ser Phe

435 440 445

Glu Leu Leu Lys Ala Lys Asn Val Ser Lys Gln Ser Trp Val Thr Gln

450 455 460

30

Glu Asn Phe Gln Gly Ala Arg Arg Met Ala Phe Leu Gly Arg Arg Gly

465 470 475 480

Tyr Glu Asp Lys Leu Leu Gly Thr Arg Gly Gln Trp Val Val Asp Leu

35 485 490 495

Lys Ala Asp Met Thr Arg Phe Ser Pro Thr Pro Val Ala Ser Asp Phe

500 505 510
 Gly Tyr Gly Leu His Leu Met Leu Trp Gly Arg Gln Lys Lys Leu Ser
 515 520 525
 5 Arg Lys Asp Leu Gln Gln Ala Val Asp Asp Ala Val Val Trp Gly Val
 530 535 540
 Leu Asp Ala Lys Asp Ala Ala Thr Val Ile Ser Thr Met Gln Glu Asp
 10 545 550 555 560
 Met Gly Lys His Pro Ile Glu Thr Arg Leu Glu Leu Lys Met Ala Asp
 565 570 575
 15 Asp Ser Phe Arg Ala Leu Val Pro Arg Ile Gln Thr Leu Glu Leu Ser
 580 585 590
 C1 Arg Phe Ser Arg Ala Leu Ala Arg Ala Leu Pro Trp Ser Glu Gln Leu
 595 600 605
 20 Pro Arg Ala Ser Ala Glu Phe Arg Arg Ala Val Tyr Ala Pro Ile Trp
 610 615 620
 Glu Ala Tyr Leu Arg Glu Val Gln Glu Gln Gly Ser Leu Met Leu Asn
 25 625 630 635 640
 Asp Leu Ser Pro Ser Arg Ala Ala Gln Ile Ala Lys Trp Tyr Phe Gln
 645 650 655
 30 Lys Asp Pro Thr Val Arg Asp Leu Gly Lys Asp Leu Gln Leu Ile Glu
 660 665 670
 Ser Glu Trp Arg Pro Gly Gly Gly Asn Phe Ser Phe Ala Glu Val Ile
 675 680 685
 35 Ser Lys Asn Pro Asn Thr Leu Met Arg Cys Arg Asn Phe Val Ser Gly
 690 695 700

Met Val Arg Leu Arg Arg Ala Ile Asp Glu Arg Lys Ala Pro Asp Glu
705 710 715 720

5 Leu Arg Thr Val Phe Gly Glu Leu Glu Gly Met Trp Thr Thr Gly Phe
725 730 735

His Leu Arg Ala Ala Gly Ser Leu Leu Ser Asp Leu Ala Gln Ser Thr
740 745 750

10

Pro Leu Gly Leu Ala Gly Val Glu Arg Thr Leu Thr Val Arg Val Ala
755 760 765

15

Asp Ser Glu Glu Gln Leu Val Phe Ser Thr Ala Arg Ser Thr Gly Ala
770 775 780

C1
Ala
785

20

<210> 4
<211> 529
<212> DNA
<213> Myxococcus xanthus

25

<400> 4
Met Pro Ser Gly Cys Tyr Gly Ala Ala Ser Ala Phe Val Leu Pro Pro
1 5 10 15

30

Leu Pro Ala Met Pro Gln Ala Pro Ser Asp Val Ser Gln Val Leu Leu
20 25 30

Pro Phe Gly Gly Leu Val Gly Arg Glu Val Asp Leu Asp Ala Phe Leu
35 40 45

35

Gln Thr Leu Met Asp Arg Ile Ala Ile Thr Leu Gln Ala Asp Arg Gly
50 55 60

Thr Leu Trp Leu Leu Asp Pro Ala Arg Arg Glu Leu Phe Ser Arg Ala
65 70 75 80

5 Ala His Leu Pro Glu Val Ser Gln Ile Arg Val Lys Leu Gly Gln Gly
85 90 95

Val Ala Gly Thr Val Ala Lys Ala Gly His Ala Ile Asn Val Pro Asp
100 105 110

10 Pro Arg Gly Glu Gln Arg Phe Phe Ala Asp Ile Asp Arg Met Thr Gly
115 120 125

15 Tyr Arg Thr Thr Ser Leu Leu Ala Val Pro Leu Arg Asp Gly Asp Gly
130 135 140

C1 Ala Leu Tyr Gly Val Leu Gln Val Leu Asn Arg Arg Gly Glu Asp Arg
145 150 155 160

20 Phe Thr Asp Glu Asp Thr Gln Arg Leu Thr Ala Ile Ala Ser Gln Val
165 170 175

Ser Thr Ala Leu Gln Ser Thr Ser Leu Tyr Gln Glu Leu Gln Arg Ala
180 185 190

25 Lys Glu Gln Pro Gln Val Pro Val Gly Tyr Phe Phe Asn Arg Ile Ile
195 200 205

Gly Glu Ser Pro Gln Leu Gln Ala Ile Tyr Arg Leu Val Arg Lys Ala
30 210 215 220

Ala Pro Thr Asp Ala Thr Val Leu Leu Arg Gly Glu Ser Gly Ser Gly
225 230 235 240

35 Lys Glu Leu Phe Ala Arg Ala Val His Val Asn Gly Pro Arg Arg Asp
245 250 255

Gln Pro Phe Ile Lys Val Asp Cys Ala Ala Leu Pro Ala Thr Leu Ile
260 265 270

5 Glu Asn Glu Leu Phe Gly His Glu Arg Gly Ala Phe Thr Gly Ala Asp
275 280 285

His Arg Val Pro Gly Lys Phe Glu Ala Ala Ser Gly Gly Thr Val Phe
290 295 300

10 Ile Asp Glu Ile Gly Glu Leu Pro Leu Pro Val Gln Gly Lys Leu Leu
305 310 315 320

Arg Val Ile Gln Asp Arg Glu Phe Glu Arg Val Gly Gly Thr Gln Ala
325 330 335

15 Val Lys Val Asp Val Arg Ile Val Ala Ala Thr His Arg Asp Leu Ala
340 345 350

20 Arg Met Val Ala Glu Gly Arg Phe Arg Glu Asp Leu Tyr Tyr Arg Ile
355 360 365

Lys Val Val Glu Val Val Leu Pro Pro Leu Arg Glu Arg Gly Ala Glu
370 375 380

25 Asp Ile Glu Arg Leu Ala Arg His Phe Val Ala Ala Val Ala Arg Arg
385 390 395 400

His Arg Leu Thr Pro Pro Arg Leu Ser Ala Ala Ala Val Glu Arg Leu
405 410 415

30 Lys Arg Tyr Arg Trp Pro Gly Asn Val Arg Glu Leu Glu Asn Cys Ile
420 425 430

35 Glu Ser Ala Val Val Leu Cys Glu Gly Glu Ile Leu Glu Glu His Leu
435 440 445

Pro Leu Pro Asp Val Asp Arg Ala Ala Leu Pro Pro Pro Ala Ala Ala

450 455 460

Gln Gly Val Asn Ala Pro Thr Ala Pro Ala Pro Leu Asp Ala Gly Leu

465 470 475 480

5

Leu Pro Leu Ala Glu Val Glu Arg Arg His Ile Leu Arg Val Leu Asp

485 490 495

Ala Val Lys Gly Asn Arg Thr Ala Ala Ala Arg Val Leu Ala Ile Gly

10 500 505 510

Arg Asn Thr Leu Ala Arg Lys Leu Lys Glu Tyr Gly Leu Gly Asp Glu

515 520 525

15 Pro

<210> 5

20 <211> 292

<212> DNA

<213> Myxococcus xanthus

<400> 5

25 Met Arg Ala Ser Gln Ala Glu Ala Pro His Ser Arg Arg Leu Thr Met

1 5 10 15

Glu Val Arg Phe His Gly Val Arg Gly Ser Ile Ala Val Ser Gly Ser

20 25 30

30

Arg Ile Gly Gly Asn Thr Ala Cys Val Glu Val Thr Ser Gln Gly His

35 40 45

Arg Leu Ile Leu Asp Ala Gly Thr Gly Ile Arg Ala Leu Gly Glu Ile

35 50 55 60

Met Met Arg Glu Gly Ala Pro Gln Glu Ala Thr Leu Phe Phe Ser His

C1

65 70 75 80

Leu His Trp Asp His Val Gln Gly Phe Pro Phe Phe Thr Pro Ala Trp

85 90 95

5

Leu Pro Thr Ser Glu Leu Thr Leu Tyr Gly Pro Gly Ala Asn Gly Ala

100 105 110

Gln Ala Leu Gln Ser Glu Leu Ala Ala Gln Met Gln Pro Leu His Phe

10 115 120 125

Pro Val Pro Leu Ser Thr Met Arg Ser Arg Met Asp Phe Arg Ser Ala

130 135 140

15 Leu His Ala Arg Pro Val Glu Val Gly Pro Phe Arg Val Thr Pro Ile

145 150 155 160

Asp Val Pro His Pro Gln Gly Cys Leu Ala Tyr Arg Leu Glu Ala Asp

165 170 175

20

Gly His Ser Phe Val Tyr Ala Thr Asp Val Glu Val Arg Val Gln Glu

180 185 190

Leu Ala Pro Glu Val Gly Arg Leu Phe Glu Gly Ala Asp Val Leu Cys

25 195 200 205

Leu Asp Ala Gln Tyr Thr Pro Asp Glu Tyr Glu Gly Arg Lys Gly Val

210 215 220

30 Ala Lys Lys Gly Trp Gly His Ser Thr Met Met Asp Ala Ala Gly Val

225 230 235 240

Ala Gly Leu Val Gly Ala Arg Arg Leu Cys Leu Phe His His Asp Pro

245 250 255

35

Ala His Gly Asp Asp Met Leu Glu Asp Met Ala Glu Gln Ala Arg Ala

260 265 270

C1

Leu Phe Pro Val Cys Glu Pro Ala Arg Glu Gly Gln Arg Leu Val Leu
275 280 285

5 Gly Arg Ala Ala
290

<210> 6

10 <211> 168

<212> DNA

<213> Myxococcus xanthus

<400> 6

C1 15 Met Pro Gly Pro Arg Cys Ala Glu Asn Asp Trp Val Ala Leu Leu Val
1 5 10 15

Arg Val Asn His Glu Lys Val Ala Ala Ala Gln Leu Gly Lys His Gly
20 25 30

20

Tyr Glu Phe Phe Leu Pro Thr Tyr Thr Pro Pro Lys Ser Ser Gly Val
35 40 45

Lys Ala Lys Leu Pro Leu Phe Pro Gly Tyr Leu Phe Cys Arg Tyr Gln
25 50 55 60

Pro Leu Asn Pro Tyr Arg Ile Val Arg Ala Pro Gly Val Ile Arg Leu
65 70 75 80

30 Leu Gly Gly Asp Ala Gly Pro Glu Ala Val Pro Ala Gln Glu Leu Glu
85 90 95

Ala Ile Arg Arg Val Ala Asp Ser Gly Val Ser Ser Asn Pro Cys Asp
100 105 110

35

Tyr Leu Arg Val Gly Gln Arg Val Arg Ile Ile Glu Gly Pro Leu Thr
115 120 125

Gly Leu Glu Gly Ser Leu Val Thr Ser Lys Ser Gln Leu Arg Phe Ile
130 135 140

5 Val Ser Val Gly Leu Leu Gln Arg Ser Val Ser Val Glu Val Ser Ala
145 150 155 160

Glu Gln Leu Glu Pro Ile Thr Asp
165

10

<210> 7

<211> 79

<212> DNA

15 <213> Myxococcus xanthus

<400> 7

Met Asp Lys Arg Ile Ile Phe Asp Ile Val Thr Ser Ser Val Arg Glu
1 5 10 15

20

Val Val Pro Glu Leu Glu Ser His Pro Phe Glu Pro Glu Asp Asp Leu
20 25 30

Val Gly Leu Gly Ala Asn Ser Leu Asp Arg Ala Glu Ile Val Asn Leu
25 35 40 45

Thr Leu Glu Lys Leu Ala Leu Asn Ile Pro Arg Val Glu Leu Ile Asp
50 55 60

30 Ala Lys Thr Ile Gly Gly Leu Val Asp Val Leu His Ala Arg Leu
65 70 75

<210> 8

35 <211> 420

<212> DNA

<213> Myxococcus xanthus

<400> 8

Met Gly Pro Val Gly Ile Glu Ala Met Asn Ala Tyr Cys Gly Ile Ala

1 5 10 15

5

Arg Leu Asp Val Leu Gln Leu Ala Thr His Arg Gly Leu Asp Thr Ser

20 25 30

Arg Phe Ala Asn Leu Leu Met Glu Glu Lys Thr Val Pro Leu Pro Tyr

10 35 40 45

Glu Asp Pro Val Thr Tyr Gly Val Asn Ala Ala Arg Pro Ile Leu Asp

50 55 60

15 Gln Leu Thr Ala Ala Glu Arg Asp Ser Ile Glu Leu Leu Val Ala Cys

65 70 75 80

Thr Glu Ser Ser Phe Asp Phe Gly Lys Ala Met Ser Thr Tyr Leu His

85 90 95

20

Gln His Leu Gly Leu Ser Arg Asn Cys Arg Leu Ile Glu Leu Lys Ser

100 105 110

Ala Cys Tyr Ser Gly Val Ala Gly Leu Gln Met Ala Val Asn Phe Ile

25 115 120 125

Leu Ser Gly Val Ser Pro Gly Ala Lys Ala Leu Val Val Ala Ser Asp

130 135 140

30 Leu Ser Arg Phe Ser Ile Ala Glu Gly Gly Asp Ala Ser Thr Glu Asp

145 150 155 160

Trp Ser Phe Ala Glu Pro Ser Ser Gly Ala Gly Ala Val Ala Met Leu

165 170 175

35

Val Ser Asp Thr Pro Arg Val Phe Arg Val Asp Val Gly Ala Asn Gly

180 185 190

C1

Tyr Tyr Gly Tyr Glu Val Met Asp Thr Cys Arg Pro Val Ala Asp Ser
195 200 205

5 Glu Ala Gly Asp Ala Asp Leu Ser Leu Leu Ser Tyr Leu Asp Cys Cys
210 215 220

Glu Asn Ala Phe Arg Glu Tyr Thr Arg Arg Val Pro Ala Ala Asn Tyr
225 230 235 240

10

Ala Glu Ser Phe Gly Tyr Leu Ala Phe His Thr Pro Phe Gly Gly Met
245 250 255

15 Val Lys Gly Ala His Arg Thr Met Met Arg Lys Phe Ser Gly Lys Asn
260 265 270

C1

Arg Gly Asp Ile Glu Ala Asp Phe Gln Arg Arg Val Ala Pro Gly Leu
275 280 285

20 Thr Tyr Cys Gln Arg Val Gly Asn Ile Met Gly Ala Thr Met Ala Leu
290 295 300

Ser Leu Leu Gly Thr Ile Asp His Gly Asp Phe Ala Thr Ala Lys Arg
305 310 315 320

25

Ile Gly Cys Phe Ser Tyr Gly Ser Gly Cys Ser Ser Glu Phe Phe Ser
325 330 335

30 Gly Val Val Thr Glu Glu Gly Gln Gln Arg Gln Arg Ala Leu Gly Leu
340 345 350

Gly Glu Ala Leu Gly Arg Arg Gln Gln Leu Ser Met Pro Asp Tyr Asp
355 360 365

35 Ala Leu Leu Lys Gly Asn Gly Leu Val Arg Phe Gly Thr Arg Asn Ala
370 375 380

Glu Leu Asp Phe Gly Val Val Gly Ser Ile Arg Pro Gly Gly Trp Gly
385 390 395 400

Arg Pro Leu Leu Phe Leu Ser Ala Ile Arg Asp Phe His Arg Asp Tyr
5 405 410 415

Gln Trp Ile Ser
420

10

<210> 9

<211> 325

<212> DNA

<213> Myxococcus xanthus

15

<400> 9

Met Ser Ser Val Ala Thr Ala Val Pro Leu Thr Ala Arg Asp Ser Ala
1 5 10 15

20

Val Ser Arg Arg Leu Arg Ile Thr Pro Ser Met Cys Gly Gln Thr Ser
20 25 30

Leu Phe Ala Gly Gln Ile Gly Asp Trp Ala Trp Asp Thr Val Ser Arg
35 40 45

25

Leu Cys Gly Thr Asp Val Leu Thr Ala Thr Asn Ala Ser Gly Ala Pro
50 55 60

30

Thr Tyr Leu Ala Phe Tyr Tyr Phe Arg Ile Arg Gly Thr Pro Ala Leu
65 70 75 80

His Pro Gly Ala Leu Arg Phe Gly Asp Thr Leu Asp Val Thr Ser Lys
85 90 95

35

Ala Tyr Asn Phe Gly Ser Glu Ser Val Leu Thr Val His Arg Ile Cys
100 105 110

Lys Thr Ala Glu Gly Gly Ala Pro Glu Ala Asp Ala Phe Gly His Glu

115

120

125

Glu Leu Tyr Glu Gln Pro Gln Pro Gly Arg Ile Tyr Ala Glu Thr Phe

5

130

135

140

Asn Arg Trp Ile Thr Arg Ser Asp Gly Lys Ser Asn Glu Ser Leu Ile

145

150

155

160

10 Lys Ser Ser Pro Val Gly Phe Gln Tyr Ala His Leu Pro Leu Leu Pro

165

170

175

Asp Glu Tyr Ser Pro Arg Arg Ala Tyr Gly Asp Ala Arg Ala Arg Gly

180

185

190

15

Thr Phe His Asp Val Asp Ser Ala Glu Tyr Arg Leu Thr Val Asp Arg

195

200

205

Phe Pro Leu Arg Tyr Ala Val Asp Val Ile Arg Asp Val Asn Gly Val

20

210

215

220

Gly Leu Ile Tyr Phe Ala Ser Tyr Phe Ser Met Val Asp Trp Ala Ile

225

230

235

240

25 Trp Gln Leu Ala Arg His Gln Gly Arg Ser Glu Gln Ala Phe Leu Ser

245

250

255

Arg Val Val Leu Asp Gln Gln Leu Cys Phe Leu Gly Asn Ala Ala Leu

260

265

270

30

Asp Thr Thr Phe Asp Ile Asp Val Gln His Trp Glu Arg Val Gly Gly

275

280

285

Gly Glu Glu Leu Phe Asn Val Lys Met Arg Glu Gly Ala Gln Gly Arg

35

290

295

300

Asp Ile Ala Val Ala Thr Val Lys Val Arg Phe Asp Ala Ala Ser Glu

305 310 315 320

Gly Gly Arg Arg Gly

325

5

<210> 10

<211> 83

<212> DNA

10 <213> Myxococcus xanthus

<400> 10

Met Thr Asp Glu Gln Ile Arg Gly Val Val His Gln Ser Ile Val Arg

1

5

10

15

15

Val Leu Pro Arg Val Arg Ser Asn Glu Ile Ala Gly His Leu Asn Leu

20

25

30

Arg Glu Leu Gly Ala Asp Ser Val Asp Arg Val Glu Ile Leu Thr Ser

20

35

40

45

Ile Leu Asp Ser Leu Arg Leu Gln Lys Thr Pro Leu Ala Lys Phe Ala

50

55

60

25

Asp Ile Arg Asn Ile Asp Ala Leu Val Ala Phe Leu Ala Gly Glu Val

65

70

75

80

Ala Gly Gly

30

<210> 11

<211> 374

<212> DNA

35 <213> Myxococcus xanthus

<400> 11

Met Met Gln Glu Arg Gly Val Ala Leu Pro Phe Glu Asp Pro Val Thr

1 5 10 15

Asn Ala Val Asn Ala Ala Arg Pro Ile Leu Asp Ala Met Ser Pro Glu

5 20 25 30

Ala Arg Glu Arg Ile Glu Leu Leu Val Thr Ser Ser Glu Ser Gly Val

35 40 45

10 Asp Phe Ser Lys Ser Ile Ser Ser Tyr Ala His Glu His Leu Gly Leu

50 55 60

Ser Arg His Cys Arg Phe Leu Glu Val Lys Gln Ala Cys Tyr Ala Ala

65 70 75 80

15

Thr Gly Ala Leu Gln Leu Ala Leu Gly Tyr Ile Ala Ser Gly Val Ser

85 90 95

Pro Gly Ala Lys Ala Leu Val Ile Ala Thr Asp Val Thr Leu Val Asp

20 100 105 110

Glu Ser Gly Leu Tyr Ser Glu Pro Ala Met Gly Thr Gly Gly Val Ala

115 120 125

25 Val Leu Leu Gly Asp Glu Pro Arg Val Met Lys Met Asp Leu Gly Ala

130 135 140

Phe Gly Asn Tyr Ser Tyr Asp Val Phe Asp Thr Ala Arg Pro Ser Pro

145 150 155 160

30

Glu Ile Asp Ile Gly Asp Val Asp Arg Ser Leu Phe Thr Tyr Leu Asp

165 170 175

Cys Leu Lys His Ser Phe Ala Ala Tyr Gly Arg Arg Val Asp Gly Val

35 180 185 190

Asp Phe Val Ser Thr Phe Asp Tyr Leu Ala Met His Thr Pro Phe Ala

195

200

205

Gly Leu Val Lys Ala Gly His Arg Lys Met Met Arg Glu Leu Thr Pro

210

215

220

5

Cys Asp Val Asp Glu Ile Glu Ala Asp Phe Gly Arg Arg Val Lys Pro

225

230

235

240

Ser Leu Gln Tyr Pro Ser Leu Val Gly Asn Leu Cys Ser Gly Ser Val

10

245

250

255

Tyr Leu Ser Leu Cys Ser Ile Ile Asp Thr Ile Lys Pro Glu Arg Ser

260

265

270

15

Ala Arg Val Gly Met Phe Ser Tyr Gly Ser Gly Cys Ser Ser Glu Phe

275

280

285

C1

Phe Ser Gly Val Ile Gly Pro Glu Ser Val Ser Ala Leu Ala Gly Leu

290

295

300

20

Asp Ile Gly Gly His Leu Arg Gly Arg Arg Gln Leu Thr Phe Asp Gln

305

310

315

320

Tyr Val Glu Leu Leu Lys Glu Asn Leu Arg Cys Leu Val Pro Thr Lys

25

325

330

335

Asn Arg Asp Val Asp Val Glu Arg Tyr Leu Pro Leu Val Thr Arg Thr

340

345

350

30

Ala Ser Arg Pro Arg Met Leu Ala Leu Arg Arg Val Val Asp Tyr His

355

360

365

Arg Gln Tyr Glu Trp Val

370

35

<210> 12

<211> 171

<212> DNA

<213> Myxococcus xanthus

5 <400> 12

Met Asn Thr Pro Ser Leu Thr Asn Trp Pro Ala Arg Leu Gly Tyr Leu

1 5 10 15

Leu Ala Val Gly Gly Ala Trp Phe Ala Ala Asp Gln Val Thr Lys Gln

10 20 25 30

Met Ala Arg Asp Gly Ala Lys Arg Pro Val Ala Val Phe Asp Ser Trp

35 40 45

15 Trp His Phe His Tyr Val Glu Asn Arg Ala Gly Ala Phe Gly Leu Phe

50 55 60

Ser Ser Phe Gly Glu Glu Trp Arg Met Pro Phe Phe Tyr Val Val Gly

65 70 75 80

20

Ala Ile Cys Ile Val Leu Leu Ile Gly Tyr Tyr Phe Tyr Thr Pro Pro

85 90 95

Thr Met Lys Leu Gln Arg Trp Ser Leu Ala Thr Met Ile Gly Gly Ala

25 100 105 110

Leu Gly Asn Tyr Val Asp Arg Val Arg Leu Arg Tyr Val Val Asp Phe

115 120 125

30 Val Ser Trp His Val Gly Asp Arg Phe Tyr Trp Pro Ser Phe Asn Ile

130 135 140

Ala Asp Thr Ala Val Val Val Gly Ala Ala Leu Met Ile Leu Glu Ser

145 150 155 160

35

Phe Arg Glu Pro Arg Gln Gln Leu Ser Pro Gly

165 170

<210> 13

<211> 475

5 <212> DNA

<213> Myxococcus xanthus

<400> 13

Met Gly Thr Ser Glu Pro Val Glu Pro Asp His Ala Leu Ser Lys Pro

10 1 5 10 15

Pro Pro Val Ala Pro Val Gly Ala Gln Ala Leu Pro Arg Gly Pro Ala

20 25 30

15 Met Pro Gly Ile Ala Gln Leu Met Met Leu Phe Leu Arg Pro Thr Glu

35 40 45

Phe Leu Asp Arg Cys Ala Ala Arg Tyr Gly Asp Thr Phe Thr Leu Lys

50 55 60

20

Ile Pro Gly Thr Pro Pro Phe Ile Gln Thr Ser Asp Pro Ala Leu Ile

65 70 75 80

Glu Val Ile Phe Lys Gly Asp Pro Asp Leu Phe Leu Gly Gly Lys Ala

25 85 90 95

Asn Asn Gly Leu Lys Pro Val Val Gly Glu Asn Ser Leu Leu Val Leu

100 105 110

30 Asp Gly Lys Arg His Arg Arg Asp Arg Lys Leu Ile Met Pro Thr Phe

115 120 125

Leu Gly Glu Arg Met His Ala Tyr Gly Ser Val Ile Arg Asp Ile Val

130 135 140

35

Asn Ala Ala Leu Asp Arg Trp Pro Val Gly Lys Pro Phe Ala Val His

145 150 155 160

Glu Glu Thr Gln Gln Ile Met Leu Glu Val Ile Leu Arg Val Ile Phe

165 170 175

5 Gly Leu Glu Asp Ala Arg Thr Ile Ala Gln Phe Arg His His Val His

180 185 190

Gln Val Leu Lys Leu Ala Leu Phe Leu Phe Pro Asn Gly Glu Gly Lys

195 200 205

10

Pro Ala Ala Glu Gly Phe Ala Arg Ala Val Gly Lys Ala Phe Pro Ser

210 215 220

Leu Asp Val Phe Ala Ser Leu Lys Ala Ile Asp Asp Ile Ile Tyr Gln

15 225 230 235 240

Glu Ile Gln Asp Arg Arg Ser Gln Asp Ile Ser Gly Arg Gln Asp Val

245 250 255

20 Leu Ser Leu Met Met Gln Ser His Tyr Asp Asp Gly Ser Val Met Thr

260 265 270

Pro Gln Glu Leu Arg Asp Glu Leu Met Thr Leu Leu Met Ala Gly His

275 280 285

25

Glu Thr Ser Ala Thr Ile Ala Ala Trp Cys Val Tyr His Leu Cys Arg

290 295 300

His Pro Asp Ala Met Gly Lys Leu Arg Glu Glu Ile Ala Ala His Thr

30 305 310 315 320

Val Asp Gly Val Leu Pro Leu Ala Lys Ile Asn Glu Leu Lys Phe Leu

325 330 335

35 Asp Ala Val Val Lys Glu Thr Met Arg Ile Thr Pro Val Phe Ser Leu

340 345 350

Val Ala Arg Val Leu Lys Glu Pro Gln Thr Ile Gly Gly Thr Thr Tyr

355

360

365

Pro Ala Asn Val Val Leu Ser Pro Asn Ile Tyr Gly Thr His His Arg

5

370

375

380

Ala Asp Leu Trp Gly Asp Pro Lys Val Phe Arg Pro Glu Arg Phe Leu

385

390

395

400

10 Glu Glu Arg Val Asn Pro Phe His Tyr Phe Pro Phe Gly Gly Gly Ile

405

410

415

Arg Lys Cys Ile Gly Thr Ser Phe Ala Tyr Tyr Glu Met Lys Ile Phe

420

425

430

15

Val Ser Glu Thr Val Arg Arg Met Arg Phe Asp Thr Arg Pro Gly Tyr

435

440

445

His Ala Lys Val Val Arg Arg Ser Asn Thr Leu Ala Pro Ser Gln Gly

20

450

455

460

Val Pro Ile Ile Val Glu Ser Arg Leu Pro Ser

465

470

475

25

<210> 14

<211> 318

<212> DNA

<213> Myxococcus xanthus

30

<400> 14

Met Val Asp Ser Val Ser Lys Gln Ala Arg Arg Lys Val Phe Leu Phe

1

5

10

15

35

Ser Gly Gln Gly Thr Gln Ser Tyr Phe Met Ala Lys Glu Leu Phe Asp

20

25

30

Thr Gln Thr Gly Phe Lys Arg Gln Leu Leu Glu Leu Asp Glu Gln Phe

35

40

45

Lys Gln Arg Leu Gly His Ser Ile Leu Glu Arg Ile Tyr Asp Ala Arg

5

50

55

60

Ala Ala Arg Leu Asp Pro Leu Asp Asp Val Leu Val Ser Phe Pro Ala

65

70

75

80

10 Ile Phe Met Ile Glu His Ala Leu Ala Arg Leu Leu Ile Asp Arg Gly

85

90

95

Ile Gln Pro Asp Ala Val Val Gly Ala Ser Met Gly Glu Val Ala Ala

100

105

110

15

Ala Ala Ile Ala Gly Ala Ile Ser Val Asp Ala Ala Val Ala Leu Val

115

120

125

Ala Ala Gln Ala Gln Leu Phe Ala Arg Thr Ala Pro Arg Gly Gly Met

20

130

135

140

Leu Ala Val Leu His Glu Leu Glu Ala Cys Arg Gly Phe Thr Ser Val

145

150

155

160

25 Ala Arg Asp Gly Glu Val Ala Ala Ile Asn Tyr Pro Ser Asn Phe Val

165

170

175

Leu Ala Ala Asp Glu Ala Gly Leu Gly Arg Ile Gln Gln Glu Leu Ser

180

185

190

30

Gln Arg Ser Val Ala Phe His Arg Leu Pro Val Arg Tyr Pro Phe His

195

200

205

Ser Ser His Leu Asp Pro Leu Arg Glu Glu Tyr Arg Ser Arg Val Arg

35

210

215

220

Ala Asp Ser Leu Thr Trp Pro Arg Ile Pro Met Tyr Ser Cys Thr Thr

225 230 235 240

Ala Asn Arg Val His Asp Leu Arg Ser Asp His Phe Trp Asn Val Val

245 250 255

5

Arg Ala Pro Ile Gln Leu Tyr Asp Thr Val Leu Gln Leu Glu Gly Gln

260 265 270

Gly Gly Cys Asp Phe Ile Asp Val Gly Pro Ala Ala Ser Phe Ala Thr

10 275 280 285

Ile Ile Lys Arg Ile Leu Ala Arg Asp Ser Thr Ser Arg Leu Phe Pro

290 295 300

15 Leu Leu Ser Pro Ser Pro Ala Ser Thr Gly Ser Ser Met Gly

305 310 315

<210> 15

20 <211> 330

<212> DNA

<213> Myxococcus xanthus

<400> 15

25 Met Thr Glu Ala Pro Ala Pro Arg Ala Pro Ala Gln Val Pro Pro Pro

1 5 10 15

Pro Ser Ser Pro Trp Ala Leu His Thr Arg Gly Ala Ala Ser Ala Pro

20 25 30

30

Val Asn Ala Arg Lys Ala Ala Leu Phe Pro Gly Gln Gly Ser Gln Glu

35 40 45

Arg Gly Met Gly Ala Ala Leu Phe Asp Glu Phe Pro Asp Leu Thr Asp

35 50 55 60

Ile Ala Asp Ala Ile Leu Gly Tyr Ser Ile Lys Arg Leu Cys Leu Glu

65 70 75 80

Asp Pro Gly Lys Glu Leu Ala Gln Thr Gln Phe Thr Gln Pro Ala Leu

85 90 95

5

Tyr Val Val Asn Ala Leu Ser Tyr Leu Lys Arg Leu Arg Glu Gly Ala

100 105 110

Glu Gln Pro Ala Phe Val Ala Gly His Ser Leu Gly Glu Tyr Asn Ala

10 115 120 125

Leu Leu Val Ala Gly Ala Phe Asp Phe Glu Thr Gly Leu Arg Leu Val

130 135 140

15 Lys Arg Arg Gly Glu Leu Met Ser Gly Ala Ser Gly Gly Thr Met Ala

145 150 155 160

Ala Val Val Gly Cys Asp Ala Val Ala Val Glu Gln Val Leu Arg Asp

165 170 175

20

Arg Gln Leu Thr Ser Leu Asp Ile Ala Asn Ile Asn Ser Pro Asp Gln

180 185 190

Ile Val Val Ser Gly Pro Ala Gln Asp Ile Glu Arg Ala Arg Gln Cys

25 195 200 205

Phe Val Asp Arg Gly Ala Arg Tyr Val Pro Leu Asn Val Arg Ala Pro

210 215 220

30 Phe His Ser Arg Tyr Met Gln Pro Ala Ala Ser Glu Phe Glu Arg Phe

225 230 235 240

Leu Ser Gln Phe Gln Tyr Ala Pro Leu Arg Cys Val Val Ile Ser Asn

245 250 255

35

Val Thr Gly Arg Pro Tyr Ala His Asp Asn Val Val Gln Gly Leu Ala

260 265 270

Leu Gln Leu Arg Ser Pro Val Gln Trp Thr Ala Thr Val Arg Tyr Leu
275 280 285

5 Leu Glu Gln Gly Val Glu Asp Phe Glu Glu Leu Gly Pro Gly Arg Val
290 295 300

Leu Thr Arg Leu Ile Thr Ala Asn Lys Arg Gly Ala Pro Ala Pro Ala
305 310 315 320

10

Thr Ala Ala Pro Ala Lys Trp Ala Asn Ala
325 330

C1

15 <210> 16
<211> 417
<212> DNA
<213> Myxococcus xanthus

20 <400> 16
Met Ser Thr Ser Pro Val Gln Glu Leu Val Val Ser Gly Phe Gly Val
1 5 10 15

Thr Ser Ala Ile Gly Gln Gly Ala Ala Ser Phe Thr Ser Ala Leu Leu
25 20 25 30

Glu Gly Ala Ala Arg Phe Arg Val Met Glu Arg Pro Gly Arg Gln His
35 40 45

30 Gln Ala Asn Gly Gln Thr Thr Ala His Leu Gly Ala Glu Ile Ala Ser
50 55 60

Leu Ala Val Pro Glu Gly Val Thr Pro Gln Leu Trp Arg Ser Ala Thr
65 70 75 80

35

Phe Ser Gly Gln Ala Ala Leu Val Thr Val His Glu Ala Trp Asn Ala
85 90 95

Ala Arg Leu Gln Ala Val Pro Gly His Arg Ile Gly Leu Val Val Gly

100

105

110

5 Gly Thr Asn Val Gln Gln Arg Asp Leu Val Leu Met Gln Asp Ala Tyr

115

120

125

Arg Glu Arg Val Pro Phe Leu Arg Ala Ala Tyr Gly Ser Thr Phe Met

130

135

140

10

Asp Thr Asp Leu Val Gly Leu Cys Thr Gln Gln Phe Ala Ile His Gly

145

150

155

160

Met Ser Phe Thr Val Gly Gly Ala Ser Ala Ser Gly Leu Leu Ala Val

15

165

170

175

Ile Gln Ala Ala Glu Ala Val Leu Ser Arg Lys Val Asp Val Cys Ile

180

185

190

20 Ala Val Gly Ala Leu Met Asp Val Ser Tyr Trp Glu Cys Gln Gly Leu

195

200

205

Arg Ala Met Gly Ala Met Gly Thr Asp Arg Phe Ala Arg Glu Pro Glu

210

215

220

25

Arg Ala Cys Arg Pro Phe Asp Arg Glu Ser Asp Gly Phe Ile Phe Gly

225

230

235

240

Glu Ala Cys Gly Ala Val Val Val Glu Ser Ala Glu His Ala Arg Arg

30

245

250

255

Arg Gly Val Thr Pro Arg Gly Ile Leu Ser Gly Trp Ala Met Gln Leu

260

265

270

35 Asp Ala Ser Arg Gly Pro Leu Ser Ser Ile Glu Arg Glu Ser Gln Val

275

280

285

C1

Ile Gly Ala Ala Leu Arg His Ala Asp Leu Ala Pro Glu Arg Val Asp
290 295 300

Tyr Val Asn Pro His Gly Ser Gly Ser Arg Gln Gly Asp Ala Ile Glu
5 305 310 315 320

Leu Gly Ala Leu Lys Ala Cys Gly Leu Thr His Ala Arg Val Asn Thr
325 330 335

10 Thr Lys Ser Ile Thr Gly His Gly Leu Ser Ser Ala Gly Ala Val Gly
340 345 350

Leu Ile Ala Thr Leu Val Gln Leu Glu Gln Gly Arg Leu His Pro Ser
355 360 365

C1 15 Leu Asn Leu Val Asp Pro Ile Asp Ser Ser Phe Arg Trp Val Gly Ala
370 375 380

20 Thr Ala Glu Ala Gln Ser Leu Gln Asn Ala Leu Val Leu Ala Tyr Gly
385 390 395 400

Phe Gly Gly Ile Asn Thr Ala Val Ala Val Arg Arg Ser Ala Thr Glu
405 410 415

25 Ser

<210> 17

30 <211> 262

<212> DNA

<213> Myxococcus xanthus

<400> 17

35 Met Gln Ala Ala Ser Pro Pro His Arg Asp Tyr Gln Thr Leu Arg Val
1 5 10 15

Arg Phe Glu Ala Gln Thr Cys Phe Leu Gln Leu His Arg Pro Asp Ala

20

25

30

Asp Asn Thr Ile Ser Arg Thr Leu Ile Asp Glu Cys Gln Gln Val Leu

5

35

40

45

Thr Leu Cys Glu Glu His Ala Thr Thr Val Val Leu Glu Gly Leu Pro

50

55

60

10

His Val Phe Cys Met Gly Ala Asp Phe Arg Ala Ile His Asp Arg Val

65

70

75

80

Asp Asp Gly Arg Arg Glu Gln Gly Asn Ala Glu Gln Leu Tyr Arg Leu

85

90

95

15

Trp Leu Gln Leu Ala Thr Gly Pro Tyr Val Thr Val Ala His Val Gln

100

105

110

Gly Lys Ala Asn Ala Gly Gly Leu Gly Phe Val Ser Ala Cys Asp Ile

20

115

120

125

Val Leu Ala Lys Ala Glu Val Gln Phe Ser Leu Ser Glu Leu Leu Phe

130

135

140

25

Gly Leu Phe Pro Ala Cys Val Met Pro Phe Leu Ala Arg Arg Ile Gly

145

150

155

160

Ile Gln Arg Ala His Tyr Leu Thr Leu Met Thr Arg Pro Ile Asp Ala

165

170

175

30

Ala Gln Ala Leu Ser Trp Gly Leu Ala Asp Ala Val Asp Ala Asp Ser

180

185

190

Glu Lys Leu Leu Arg Leu His Leu Arg Arg Leu Arg Cys Leu Ser Lys

35

195

200

205

Pro Ala Val Thr Gln Tyr Lys Lys Tyr Ala Ser Glu Leu Gly Gly Gln

210 215 220

Leu Leu Ala Ala Met Pro Arg Ala Ile Ser Ala Asn Glu Ala Met Phe

225 230 235 240

5

Ser Asp Arg Ala Thr Leu Glu Ala Ile His Arg Tyr Val Glu Thr Gly

245 250 255

Arg Leu Pro Trp Glu Ser

10 260

<210> 18

<211> 256

<212> DNA

<213> Myxococcus xanthus

<400> 18

Met Gly Ile Met Thr Glu Gly Thr Pro Met Ala Pro Val Val Thr Leu

20 1 5 10 15

His Glu Val Glu Glu Gly Val Ala Gln Ile Thr Leu Val Asp Arg Glu

20 25 30

25 Asn Lys Asn Met Phe Ser Glu Gln Leu Val Arg Glu Leu Ile Thr Val

35 40 45

Phe Gly Lys Val Asn Gly Asn Glu Arg Tyr Arg Ala Val Val Leu Thr

50 55 60

30

Gly Tyr Asp Thr Tyr Phe Ala Leu Gly Gly Thr Lys Ala Gly Leu Leu

65 70 75 80

Ser Ile Cys Asp Gly Ile Gly Ser Phe Asn Val Thr Asn Phe Tyr Ser

35 85 90 95

Leu Ala Leu Glu Cys Asp Ile Pro Val Ile Ser Ala Met Gln Gly His

	100	105	110
	Gly Val Gly Gly Gly Phe Ala Met Gly Leu Phe Ala Asp Phe Val Val		
	115	120	125
5	Leu Ser Arg Glu Ser Val Tyr Thr Thr Asn Phe Met Arg Tyr Gly Phe		
	130	135	140
	Thr Pro Gly Met Gly Ala Thr Tyr Ile Val Pro Lys Arg Leu Gly Tyr		
10	145	150	155 160
	Ser Leu Gly His Glu Leu Leu Leu Asn Ala Arg Asn Tyr Arg Gly Ala		
	165	170	175
C/ 15	Asp Leu Glu Lys Arg Gly Val Pro Phe Pro Val Leu Pro Arg Lys Glu		
	180	185	190
	Val Leu Pro His Ala Tyr Glu Ile Ala Arg Asp Leu Ala Ala Lys Pro		
	195	200	205
20	Arg Leu Ser Leu Val Thr Leu Lys Arg His Leu Val Arg Asp Ile Arg		
	210	215	220
	Arg Glu Leu Pro Asp Val Ile Glu Arg Glu Leu Glu Met His Gly Ile		
25	225	230	235 240
	Thr Phe His His Asp Asp Val Arg Arg Arg Ile Glu Gln Leu Phe Leu		
	245	250	255

30

35 <210> 19
 <211> 424
 <212> DNA
 <213> Myxococcus xanthus

<400> 19

Met Leu Asn Leu Ile Asn Asn His Ala His Gly Tyr Val Val Thr Pro

1 5 10 15

5

Val Val Leu Ala Cys Asn Asp Ala Gly Leu Phe Glu Leu Leu Arg Gln

20 25 30

Gly Pro Lys Asp Phe Asp Arg Leu Ala Glu Ala Leu Arg Ala Asn Arg

10 35 40 45

Gly His Leu Arg Val Ala Met Arg Met Phe Glu Ser Leu Gly Trp Val

50 55 60

C1

15 Arg Arg Asp Ala Asp Asp Val Tyr Ala Val Thr Ala Ala Ala Ala

65 70 75 80

His Arg Ser Phe Pro Arg Glu Ala Gln Ser Leu Phe Ala Leu Pro Met

85 90 95

20

Asp Arg Tyr Leu Arg Gly Glu Asp Gly Leu Ser Leu Ala Pro Trp Phe

100 105 110

Glu Arg Ser Arg Ala Ser Trp Asp Thr Asp Asp Thr Leu Val Arg Glu

25 115 120 125

Leu Leu Asp Gly Ala Ile Ile Thr Pro Leu Met Leu Ala Leu Glu Gln

130 135 140

30 Arg Gly Gly Leu Lys Glu Ala Arg Arg Leu Ser Asp Leu Trp Ser Gly

145 150 155 160

Gly Asp Gly Arg Asp Thr Cys Val Pro Glu Ala Val Gln His Glu Leu

165 170 175

35

Ala Gly Phe Phe Ser Ala Gln Lys Trp Thr Arg Glu Asp Ala Val Asp

180 185 190

Ala Glu Leu Thr Pro Lys Gly Ala Phe Ile Phe Glu Arg Ala Leu Leu
195 200 205

5 Phe Ala Ile Val Gly Ser Tyr Arg Pro Met Leu Ala Ser Met Pro Gln
210 215 220

Leu Leu Phe Gly Asp Cys Asp Gln Val Phe Gly Arg Asp Glu Ala Gly
225 230 235 240

10

His Glu Leu His Leu Asp Arg Thr Leu Asn Val Ile Gly Ser Gly His
245 250 255

C/ 15 Gln His Arg Lys Tyr Phe Ala Glu Leu Glu Lys Leu Ile Ile Thr Val
260 265 270

Phe Asp Ala Glu Asn Leu Ser Ala Gln Pro Arg Tyr Ile Ala Asp Met
275 280 285

20 Gly Cys Gly Asp Gly Thr Leu Leu Lys Arg Val Tyr Glu Thr Val Leu
290 295 300

Arg His Thr Arg Arg Gly Arg Ala Leu Asp Arg Phe Pro Leu Thr Leu
305 310 315 320

25

Ile Ala Ala Asp Phe Asn Glu Lys Ala Leu Glu Ala Ala Gly Arg Thr
325 330 335

30 Leu Ala Gly Leu Glu His Val Ala Leu Arg Ala Asp Val Ala Arg Pro
340 345 350

Asp Arg Leu Ile Glu Asp Leu Arg Ala Arg Gly Leu Ala Glu Pro Glu
355 360 365

35 Asn Thr Leu His Ile Arg Ser Phe Leu Asp His Asp Arg Pro Tyr Gln
370 375 380

Pro Pro Ala Asp Arg Ala Gly Leu His Ala Arg Ile Pro Phe Asp Ser
385 390 395 400

Val Phe Val Gly Lys Ala Gly Gln Glu Val Val Pro Ala Glu Val Phe
5 405 410 415

His Ser Leu Val Glu His Leu Glu
420

10

<210> 20

<211> 19053

<212> DNA

<213> Myxococcus xanthus

C1

15

<400> 20

20

gtcgacgttg acgtcgcccg gtggcgtgcc gtgtgtcttc ttcgacgcgg aggtgcgcga 60
ggtagcgggc gacggccggc gggggccgct gtgtgcgct gagcgcgct atcgccggt 120
actggcgctg cgtggccagc gcctccatgc ttcggtgtcc tttcgcccg cgtcgctgat 180
ggctccggtg gaggtgcgcc ggtgcaaggc cctgccaggc acggtgcccg cgtcctgta 240
tcagacggcg caccggagg cctgtcctg ggagcgctg ggcgcggtg gcgaatcctg 300
cctcgtgtg ggtgaactcc ggaggggccc tgcgagggc agctacgcc tggcggctg 360
ggagggcggc cccgcgatgt tgggtctggg acccaggct ccggccacct gtgggacgt 420
ggcgcgccgg gcctggcggc acttcgcggc ggccgggggtg ctgtccatgg ccgcgccgt 480
25 cgtcctgtca ggggcgctgt gagacgcgcg gcgggggccc taccgccgcg ccagaaacgt 540
gatgcgccgc caggcctcgc ggtccgggca ctgacgcccg ggccgctcgg gactcgtca 600
ggcggtccg gtgcttcgcg cgttgagaa cacgagctgt tctcgtctgt ccgccaccg 660
cacggtgagg gtccgtcca cgcggcgag gccagcggc gtggactcg ccaggtccga 720
gagcagggag cccgcagcg gcaggtgaa gccggtggt cacatgccct ccagctcgc 780
30 gaacacggtg cgcagctct cgggggcct gcgttcgtc atggcgcggc gcaggcgac 840
catgccgctc acgaagtcc tgcaccgat gagcgtgtg gggttcttg agatgacct 900
cggaagctg aagtgcgcg caccgggcg cactcgtct ccatgagct gcaggtcct 960
gccaaggtc cgcaccgtg ggtcctctg gaagtaccac ttggcatct gcgcgcgcg 1020
gctgggtgac aagtcattca gcatgaggct gcctgtctc tgcacctcg ggaggtaggc 1080
35 ctcccagatg ggggcgtaga ccgcgcgcc gaactcggcg gaggcgggg gaagctgctc 1140
gtccagggc agcgcgggg ccaggcgcg tgagaagcg gacagctga gcgtctggat 1200
gcggggcacc agggcgcgga acgagtcac cgccatctc agctcgagcc gcgttcgat 1260

ggggtgcttg cccatgtcct cctgcatggt gctgatgacg gtggccgcgt ccttcgcgtc 1320
 cagcacgccc cagacgacgg cgtcatccac cgctgtgc aggtccttc gcgacagctt 1380
 cttctgccgt cccacagca tcaggtgcag gccgtagccg aagtcggagg ccacgggggt 1440
 gggagagaag cgcgtcatgt ccgccttcag gtccaccacc cactggccgc gggtgcccag 1500
 5 cagcttgctc tcgtagcccc ggcgtccgag gaacgccatg cgccgggcgc cctggaagtt 1560
 ctctgcgtc acccaggact gctgtgac gttcttcgcc ttgagcagct cgaacgagcc 1620
 cagccccagt gagaagccga tggcctgctg gcgcgtgagc gtggtggcgt gcaggtagtt 1680
 gcgcagctcg aactcgtct gctgggcggg gaggtcttc atccactca gcagctccac 1740
 cagggtgccc ttgagcaggg actcgtgaa gcgcatcgcg gtgacgtcct ccacgacgac 1800
 10 ctccagcagc gtggaggctt ccgacaggcg caggatttcg tactgaagc cctcggcgac 1860
 ctgcgtgcgg acggcgttct ccagcgactc tgcgacgcgg gccttgaagt cggcccaggc 1920
 ctgcggaagg ttggccgggt ccgcaagctg cgggtcgatg ccaaggcgct ccagcaccag 1980
 gcccagcacc ttctctgat tgcgtccag ctgccttg ctggcctgt ccaccaggcc 2040
 gtccatgatt tccaccgcgg tggtgccctt ctgacgagg tcgcaagga cgggccccag 2100
 C/ 15 cagcgttcc agcaactggc ccagttggc cttaccgtc gccgggtcca gcagctccac 2160
 ggtgatgccc aggcggcg agagcgctg ctcatgggac ttaccttc gcacggcgac 2220
 ctggatgcgg ccggcacggg gacgggagaa gctgagctgg tagtcgtcg tgaggacac 2280
 ccggcgggac agggccgct tggcgtggt ctcaacgcg agcagctcgt tccgcgcag 2340
 gaagcccagg cggttaggt tggggggaa gatgtccgc cagttgagct ccagccgtgt 2400
 20 gtggagcgcg ccgcgacat gccacgccac cgctcccc gtgtcagct tggccaggtc 2460
 ggtggcctgc atcagccga gtcggacag gtcggagcg acggcctcac gcatttctg 2520
 gcccagcgga tgcgcgggt agtcgtgag cgtgacggac agctccgtct ggttctcga 2580
 ggcgaggaag gacaggctgg cgctcacggc ggccttcac gcgcgggaca cctgtagcg 2640
 catccaccg atgtactgc ccagcagcag ttggggccgg ggccttgct cggcgtctc 2700
 25 cgggctcggc tcgccatga tgcgtttc gtccacgtc ccagcagat tgaagttcg 2760
 gatggacgt tcgccgttg ctccaagga gaggtgaag ccgtgcatgg cgagcttgg 2820
 cggaaggatt ttctctcc tgaagttcc ctggccagc ggcacctga tgcctggtc 2880
 ctgcagctc acgtcggga cctgcccgc cagcagctg ggaagcttct ccagcagct 2940
 gttgaccact ttatgcgcg tccccctgg ctgaagctc ctgcacgtg gccggaggtc 3000
 30 tctcgtct acgccgttc ccagctcga acaaggcgga taccagaaa gaccggtgt 3060
 cagcggacag atgccctga gggggggg ggagccgcc ccgcgggtg cgtcagggt 3120
 cgtcggccaa tccgtactc ttgatttc gcgcgagct gttgcggca atgccagca 3180
 cgcgggccgc ggcgtgctg ttcccttca cgcgtccag cagcgcagg atgtggcg 3240
 gttcgacct cgccagtgg agcaggccc catccaggg cgagggcgca gtcggcgct 3300
 35 tgacacctg agcggctgc ggaggcgga ggcggccc gtccacatc ggcaggggca 3360
 ggtgctctc gagaatctc ccttcacaga gcaccagc gctctgata cagttctca 3420
 gctccgcac gttccggc cagcggtagc gctgaggcg ctccaccgc gcggcgctga 3480

ggcggggagg cgctcagccgg tgcctccggg cgacggcggc gacgaagtgg cgggagagcc 3540
 gctcagatgc ctccgcggcg cgctcccgca gggcgggcag caccacctcg accacctga 3600
 tgcggtagta gaggtcctcg cggaagcggc cctcgccac catcggggccc aggtcccgat 3660
 gggtagccgc gacgatgcgc acgtccacct tcacggcctg ggtgcctccc acgcgctcga 3720
 5 actcgcgatc ctggatgacc cgcagcaact tgcctgcac cggcaggggc agctcgcaa 3780
 tctcgtcat gaacacggtg ccgccgctgg ccgctcgaa ctgcccggc acgcggtgt 3840
 ccgcgcccgt gaaggcggcg cgttcgtggc cgaagagctc gttctcatg agcgtggcgg 3900
 gcagcggcg gcagtcacc ttgatgaagg gctgttcct gcggggacca ttcagtgga 3960
 cggcagggc gaacagctcc ttccgctgc cactctgcc gcgcagcagc accgtcgcat 4020
 10 cggtagggcg ggcctgcgc accagtcggt agatggcctg gagctcggg gactcgcca 4080
 tgatcggtt gaagaagtag cccaccgta cctggggctg ctctctcgc cgctggagct 4140
 ctgatagag gctggtgctc tggagggcg tctcacctg cgaggcagtg gcggtgagcc 4200
 gctgcgtgc ctgcgtggtg aagcggctct cgcgcggcg gttgaggacc tggagcacgc 4260
 cgtagagggc gccgtcccc tcgcgcagtg gcacggcgag caggctggtg gtgcggtagc 4320
 C 1 15 ccgtcatccg gtcgatgtcc gcgaagaagc gctgctgcc gcgcgggtcc ggcacgtga 4380
 tggcgtgcc cgccttggcg acggtgccg cgacgccctg gccagcttg acgcgaatct 4440
 gggacacctc gggcaggtgc gcggcgggc tgaacagctc gcggcggggc ggtccagca 4500
 gccagagcgt gccgcggtcc gctgcaggg tgatggcgat gcggtccatc agcgtctga 4560
 ggaacgcgc gaggtccacc tccctgccga cgagtcctcc gaaggggagg aggacctggg 4620
 20 agacgtccga gggggcttg ggcattggcg gcaacggcg caggacgaag gcggaggccg 4680
 caccataaca tccagagggc atgggactgc cccctctcag gccgcggcg ccagcaccag 4740
 ccgctggcct tcgcgtgcgg gctgcacac ggggaagagg gcgcgggcct gctccgcat 4800
 gtctcagac atgtcgtgc cgtgcgcgg gtcattgttg aacaggcaca gccgcgcgc 4860
 cccaccagc ccggccacgc ccgcggcatc catcatggtg gagtggccc agccctctt 4920
 25 gccacgccc ttgcggcct cgtattcgtc cggcgtgtac tgcgcatcca ggcacaggac 4980
 gtccgcgcc tcgaagaggc ggcccacctc cggcgcgagc tctgcaccc gcacctcac 5040
 gtccgtggcg tagacgaacg aatggccatc cgcctccagg cgttacgcca ggcacccctg 5100
 cgggtgcggc acgtcagtg gcgtgacgc gaagggggc acctccacgg gtcgggcatg 5160
 caacgccgag cggaaagcca tccgcgagcg catggtgctc agcggcaccg gaaaatgaag 5220
 30 cggctgcatc tgcgcggcca actcgactg gagcgcttg gcccattcg cggccggacc 5280
 gtagagcgtc agctcgagc tgggcagcca ggccggcgtg aagaagggga agccctgcac 5340
 gtgtcccaa tgcagatgc agaagaagag cgtggcctcc tggggcgcgc cctcgcgcat 5400
 catgatttc cccagtgcgc gcatgcccgt ccccgcatcc aggatgaggc ggtggccctg 5460
 gctggtcacc tccacgagg ccgtgttgc accaatgcgc gagcccgaca ccgcgatgct 5520
 35 ccccgaaacg ccatgaaacc ggacttccat cgtaatctc ctggaatggg gggcctccgc 5580
 ctgggacgcc ctcatcccc gagcctcaga gcacggggtg tgccattccc aaatgccgg 5640
 aatcaggagc gcgggcctcg ggctcgtcca ccggtgctcc agaatggatc gcgctgcct 5700

ggtgcgggcg atccaaagcg gtgcaggctg cccgcaggac ggggcggcgg gcacgtcttc 5760
 caacgtccca cggcagtcct gtcttcagat ctctcccgat gcgggaaggc gtccaggagg 5820
 ttgcaccgag catcgagcgg ggctgtgtgt ttcaagtctt gtcggagcct cggacacaac 5880
 cgtctgggtt ctgggaatgc gccggcttcc gtctactcca gagtgattca atggctctcg 5940
 5 agtgcagggt tagcaatcct cgggccgtaa ccacgccgtt gaaggcagtc acgtctctgt 6000
 cacgcttggg gtgtttccag ctcaacgggt gttatcctt cagggcgggt tgcttgacac 6060
 gctgcctcat ggaagcgtat gcaaaacaat gaaaacgggt tcgttgccga gccttagggc 6120
 ctccagaacg ccatacctcg ggacccaggc agccggaatt tgagacgggg ctgtcagcgg 6180
 ttgaacgca aggatgcggc ggggggtgtg gcggcagccc gaccagaatt cggttggtgt 6240
 10 gccagttatt gtcagattct gagaaatagc aggttggggg gaagttgcaa tgcttgggcc 6300
 gcgggtgtct gagaacgatt gggttgcatt gctcgtccgc gtcaatcacg agaaagtggc 6360
 tgccgctcag ttggggaaac acggctacga gttcttctg ccgacgtaca cgcttccaa 6420
 gtctcgggt gtgaaggcga agcttccgt ctctccggg tacctttct gtcgttacca 6480
 gccgtcaat ccgtaccgca tcgtccgggc gcccggggtc atccggctgc tcggagggtga 6540
 C1 15 cgcgggggcg gaagccgtgc ccgcacagga attggaggcc atccgccggg tcgaggattc 6600
 ggggtgtctt tccaatcctt gtgactatct gcgggtgggg cagcgcgtgc gcatcatcga 6660
 agggccctg acaggtctgg aaggaagtct ggtgacgagc aagagccaac tccggtcat 6720
 tgctccgtg gggctgtac agcgtcgggt gtccgtggag gtgagcgccg agcaactgga 6780
 accgatcacc gactgattcc gcggacatcc cctccattc ctctacacc ccgacccgca 6840
 20 gcaaggcttc agggaccgtg agtcgttcca tggacaagag aattattttc gacatcgtca 6900
 ccagcagtgt tcgggagggtg gtacccgaac tcgaatcaca tccgttcgag ccggaggatg 6960
 acctggtcgg actgggcgcg aactcgtctg accgcgccga aatcgtcaac ctacgctgg 7020
 agaagctggc gctcaacatc ccccggtcgc agctgattga cgcgaagacc attggcgggc 7080
 tggtgacgt ccttcacgcg aggtgtgag gcgaagccat ggggccggtc gggattgaag 7140
 25 ccatgaatgc ctactgtggc atgccagggt tggatgtgtt gcagctggcg acccaccgtg 7200
 gcctggacac ctcccgcttc gcgaacctgc tcatggagga gaagaccgtc ccgtccct 7260
 atgaggaccc tgtcacctac ggcgtgaatg ccgcccggcc catctggac cagttgaccg 7320
 cggcggaaac ggacagcatc gagctgtggt tggcttcac ggagtctctg ttgacttcg 7380
 gcaaggccat gagcacctac ctgcaccagc acctggggct gagccgcaac tgccggctca 7440
 30 tcgagctcaa gagcgctgc tactccgggg tcgccgggct gcagatggcc gtcaacttca 7500
 tctgtccgg cgtgtcccg ggggccaagg ccctggtgtt ggcctcgcac ctgtcgcgt 7560
 tctcatcgc cgaaggggga gatgcctcca cggaggactg gtccttcgc gagccgagct 7620
 cgggtgcggg cgcggtggcc atgtggtga gcgacacgcc ccgggtgttc cgcgtcagc 7680
 tggggcgaa cggctactac ggctacgagg tgatggatac ctgccgccg gtggcggaca 7740
 35 gcgaagcggg agacgcggac ctgtcgtcc tctgtacct ggactgtgt gagaacgcct 7800
 tccgggagta caccgcgcgc gtcccgcgg cgaactacgc ggagagcttc ggctacctcg 7860
 cctccacac gccgttggc ggcattgtga agggcgccca ccgcacgatg atgcgaagt 7920

tctccggcaa gaaccgcggg gacatcgaag cggacttcca gcggcgagtg gccccgggc 7980
 tgacctactg ccagcgctg gggaacatca tgggcgcgac gatggcgctc tcgtctctcg 8040
 ggaccatcga ccacggcgac ttcgccaccg cgaagcggat tggctgctc tcgtatggct 8100
 cggggtgcag ctcgagttc ttcagcggcg tggtagcga ggaagggcag cagcggcagc 8160
 5 ggcctctggg gctgggagaa gcgctggggc gccggcagca gctctccatg ccggattacg 8220
 acgcgctgct gaaggggaac ggcctggtgc gcttcgggac ccggaacgcc gagctggatt 8280
 tcggtgtcgt cggcagcatc cggccgggcg ggtggggcag gcccttgctc ttctgtcgg 8340
 cgattcgtga cttccatcgc gactaccaat ggatttcta gcctcggggc ttcgagcaaa 8400
 gccatgtcca gcgtagcgac ggccgtcccc ctgacggccc gtgacagcgc ggtgagccgc 8460
 10 cggctgcgaa tcacccccag catgtgcggc cagacgtcct tgttcgccgg gcagattggc 8520
 gactgggcat gggacaccgt cagccgctg tgtggcacgg acgtgctgac cgcgaccaac 8580
 gcctcaggcg cgccaccta cctggccttc tattacttc gcatccgggg cagcccgcg 8640
 ctgcatcccg gcgcgctcg cttcggcgac acgctggacg tcacgtcgaa ggcgtacaac 8700
 ttcggcagcg aatccgtcct gacggtgcac cgcatctgca agacggcgga gggcggcgct 8760
 C 15 ccggaggcgg atgccttcg ccatgaagag ctgtacgagc agccccagcc aggcgcgac 8820
 tacgcggaga cctcaaccg gtggatcacg cgctcggacg gcaagtcgaa cgagagcctg 8880
 atcaagtctc cgccgtggg gttccagtac gcacacctgc cgctcttgcc ggacgaatac 8940
 tcgccgcggc gggcctatg ggacgcgcgg gcgcggggca ccttcacga tgtggactcc 9000
 gcggagtacc ggctgaccgt ggaccgctc ccgctcgct acgcggtgga cgtcatccgg 9060
 20 gacgtcaatg ggggtgggct catctacttc gcgtcgtatt tctgatggt ggactgggcc 9120
 atctggcagc tggcgaggca ccagggacgc agcgagcagg ccttctgtc gcgcgtggtg 9180
 ctggaccagc aactgtgctt cctcggaac gcggcgctgg acaccacct cgacatcgac 9240
 gtgcagcact gggagcgggt gggcggcggg gaagagctgt tcaacgtgaa gatgcgcgag 9300
 ggcgcgcagg gccgggacat cgccgtggcg acggtaagg tgcgttcga cgccgcttcg 9360
 25 gaaggaggcc gccgtgggtg agccgatgac agacgaacaa atccgcggag tcgtgcacca 9420
 gtccatctg gcgctctgc ccgcgctgc ctccaacgag attgcgggcc acttgaacct 9480
 ccgcgagctg ggcgcggact ccgtggaccg ggtcgagatt ctacgtcca tctggacag 9540
 cctgcggctg cagaagacgc cactggcgaa gttcgccgac atccgaaca tcgacgcgct 9600
 ggtggcgctc ctggccggtg aggtcgcggg tggctgagcg ggtcccggc ggagtcggca 9660
 30 tcgaggccat caacgcctac ggcggcgccg cctccattcc ggtgttgac ttgtccggg 9720
 gccggcggtt ggaccccgaa gcgattctc aacctgatga tgcaggagcg cggcgctcg 9780
 ctgccgttcg aggacccgt caccaacgcg gtcaatgcg cgcgcccat cctggacgcg 9840
 atgtcggcg agggccggga gcgcatcgag ctctggtca cctcgagcga gtccggcgctg 9900
 gacttcagca agtccatctc ctgtagcg cagagcacc tggggctgag ccgccactgc 9960
 35 cggttcctgg aggtgaagca ggcgtgtac gccgccaccg gagcgctcca gctagcgctg 10020
 ggctacatcg cgtcgggctg gtcaccggg gccaaaggccc tggtagttgc cagggacgtg 10080
 acgctggtg acgagagcg tctgtactcc gagccggcg tgggcaccgg cggcgctgcc 10140

gtgctgctgg gcgacgagcc gcgcgtgatg aagatggacc tgggagcgtt cggcaactac 10200
 agctacgacg tcttcgacac cgcgcggccc tcgccggaga ttgatalcgg cgacgtggac 10260
 cggctgctct tcactacct ggactgcctc aagcacagct tcgcccgta tggccgccgg 10320
 gtggacggtg tcgacttcgt gtcgacgttc gactacctgg cgatgcacac gccgttcgcc 10380
 5 ggactggtga aggccgggca ccgcaagatg atgcgcgagc tcaccccggtg cgacgtggac 10440
 gaaatcgaag cggacttcgg ccggcgcggtg aagccgtcac tgcagtaccg gagtctggtc 10500
 gggaaacctgt gctccggctc cgtgtacctg agcctgtgca gcatcatga caccatcaag 10560
 cccgagcgggt ccgctcgggt gggaatgttc tcctatgggt cgggtgtc gtcggagttc 10620
 ttacgcggtg tcactggccc ggagtccgtg tcgcgctag ctgggttga catcgggtgc 10680
 10 cacctccggg ggcgcccca gctcacgttc gaccaatag tcgaattgct gaaagagaac 10740
 ctctgctgtc tggttccaac gaagaaccgg gacgtggacg tggagcgcta cctcccgctg 10800
 gtgacgcgga cggcgagccg cccgcgcatg ctgccttgc gaagggtcgt ggactatcat 10860
 cgctagtagc agtgggtgta gctacatgc cactccaat tccgacgaat gaacactcct 10920
 tccttgacga actggcctgc ccgcctgggc tatctcctg ccgttggcg cgcatgttc 10980
 15 ggcggccgac aagtcaccaa acagatggcg cgcgacgggg cgaaaaggcc cgtcgcgtc 11040
 ttgatagct ggtggcactt ccactacgtg gagaaccgag cgggtgcgtt cgtctgttc 11100
 tccagcttcg gcgaagagt ggcgatgcct tctctacg tcgtggcg cactgcac 11160
 gtgttgcta ttgctacta ctctacacg ccgccgacga tgaagctcca gcgtggtcg 11220
 ctggcgacga tgattggcg cgcgtgggc aactacgtg accgggtgc cctgcgtac 11280
 20 gtggtggatt tcgtgcatg gcacgtgggg gaccgctct attggccctc ctcaacac 11340
 gcggacacag cggtagtctg aggggccgcc ctgatgatcc tggagtcgtt ccgcgagccg 11400
 cgctagcagt tctctcccg ataggcccc ccatgggtgt gcggtcgcc gccgggcaa 11460
 ggactggagt tcattgggac ctacagacca gttgagccg accacgcctt gtcaaaacca 11520
 ccgcctgtcg cggccgtcg cggccaggca ctgcctcgc gtccggcaat gcccggcac 11580
 25 gcgcagtga tgatgtgtt cctgcggccc acggagtcc tggaccgtg cgcgcccgg 11640
 tacggtgaca cctcacct caagattcc ggacgccgc cgtcatcca gaccagcat 11700
 cccgcctga tcaggtcat ctcaagggt gaccggacc tctcctcg aggaaggcg 11760
 aacaacgggt tgaagccgt ggtgggtgag aactcgtgc tgggttga cgggaaggcg 11820
 caccggcgtg atcgaagct catcatgcc acctcctg gtgaacggat gcatcgat 11880
 30 ggctcgtca tcgggacat cgtcaatgc gcgttgacc ggtggccgt cgggaaggcg 11940
 ttccggtcc atgaagagac gcagcagatc atgtggagg tgattccg ggtgatttc 12000
 ggctggagg acgcccggac cattgccag ttccggcacc acgtgcacca ggtgtcaag 12060
 ctggccctgt tctgttcc gaacggggag ggcaagccc cgcggagggt ctgcgcgg 12120
 gccgtggga aggcgttcc ctccctggac gtgtcgcgt cgtgaaggc gattgacgac 12180
 35 atcatctacc aggagattca ggaccggcg agccaggaca tcagcggcg gcaggacgtg 12240
 ctctcgtga tgatgcagt gcactacgac gacggctccg tgatgacgcc ccaggagctg 12300
 cgcgacgagc tgatgacgt gctgatggcg ggccacgaga cgagcgcgac catcgcccg 12360

C1

tggcgcgtct accacctctg ccgtcaccgc gatgcgatgg gcaagctgcg tgaggagatc 12420
 gcggcccaca cggcggacgc cgtgctgccg ctggcgaaga tcaacgagct gaagttcctg 12480
 gatgccgtgg tcaaggagac gatgcgcacg acgcccgtct tcagcctggt ggctcgcgtg 12540
 ctcaaggagc cacagacatc tggcggaaac acgtaccgcg cgaacgtggt gctgtcgcgc 12600
 5 aacatctacg gcacgcacca tcgcgcggac ctgtggggag acccgaaggt cttcggcca 12660
 gagcgtttcc tggaggagcg ggtgaatccg ttccactact tccccttcgg agggggcacc 12720
 cgaagtgca tcgggacgag ctgcgcctac tacgagatga agatcttcgt ctcggagacg 12780
 gtgcgcgcga tgcgcttcga taccaggccc ggctaccacg cgaaggtggt gcgcgcgagc 12840
 aacacgctgg cgcgcttca gggcgtgccc atcatcgtc agtcgcggct gccgagctga 12900
 10 accgctggc cccacatct ccagcgcggg gaacatcatg gtcgattcag tgcgaaaca 12960
 ggcacggcgg aagggtttc tttttccg ccagggcacc cagtcgtact tcatggcca 13020
 ggagctgtt gacaccaga cgggggtcaa gcggcagctg ctggagctgg acgagcaatt 13080
 caagcagcgg ctggggcact cgattctga gcgaatcat gacgcgcgcg ccgcgcggtt 13140
 ggatccgctc gacgatgccc tgggtcctt tcccgcacc ttcatgattg agcatgcgct 13200
 15 ggcgcggctg ctcatcgacc ggggtatcca gccggacgct gtcgtggcg ccagcatggg 13260
 cgagggtggc gcggcgccga ttgcgggcg aatctcagtg gacgcggccg tggccctggt 13320
 ggcggcgcag gccagctct ttcccgtac ggcgccgcg ggcggcatgc tcgcggtgct 13380
 tcacgaactg gaagcctgcc ggggcttcac gtcgctgcg cgggatggcg aggttcgacg 13440
 catcaactac ccgtgaact tcgtcctgc gcgggatgag gcgggcctgg gacggattca 13500
 20 gcaggaactc tccaacgct cggcggcgtt ccaccggtg ccggtgcgct accccttca 13560
 ttctcgcac ctggaccgcg tgaggaggga gtaccgaagc cgcgtccgcg cggattcgt 13620
 gacgtggccg cgaatccca tgtactcgt caccaccgcg aaccgggtgc acgacctgcg 13680
 cagcgaccac ttctggaacg tggcgcgcg gccatccag ctgtacgaca ccgtcctgca 13740
 actggagggg caggcggct gcgactcat cgacgtcgc cccgcgcgt ccttcgcgac 13800
 25 catcatcaag cgcactcgc cgcgggactc cagtcacgg ctctcccggt tgcagccc 13860
 ttctccgca tcgaccgga gctcgtggg gtgacgcgga gctgcgcgat gacggaggcg 13920
 cccgcacca ggggcctgc gcaggtgccc ccgcccga gctcgcctg ggcgctgcac 13980
 acccgaggag cggcgagcgc gccggtgaat gcccgcaagg ccgcgctctt cccggggcag 14040
 ggctcgcagg agcgcggcat gggggccgcg ctctcgcag agtcccgga cctgacggac 14100
 30 atcgcgcag ccatcctggg gtattccatc aagcgtctt gtttgaggga cccaggcaag 14160
 gagctggcgc agacgcagtt caccagccg gcgtgtacg tggtaacgc gtcagctac 14220
 ctgaagcggc tgcgtgaagg agcggagcag ccggccttcg tcgcgggcca cagcctgggc 14280
 gagtacaacg cgtgctggt cgcggggccc ttgcactcgc agacgggact gcggctggtg 14340
 aagcggcggg gcgaactcat gagcggcgcg tccggaggga ccatggccgc ggtggtgggc 14400
 35 tgtgatccg tggccgtgga acaggtcct cgagaccgtc agctgaccag tctggatc 14460
 gccaatca actcgcgcga ccagattgtg gtctccgac cggcgagga catcgagcg 14520
 gcacggcagt gttcgtgga ccgtggcgcg cgttacgtc cgtcaacgt gcgagcgcg 14580

C1

ttactcgc gctacatgca gccggccgcc agcgagttcg agcgcttct gtctcagttc 14640
 cagtacgcgc cgctccggtg cgtggtcatc tccaacgtca cgggccgacc ttacgtcat 14700
 gacaacgtgg tgcagggggt ggctctgcaa ctgcgcagcc cgggtcagtg gacggccacc 14760
 gtccgtacc tcttgaaca gggcgtggag gacttcgagg agctggggcc cggccgcgtg 14820
 5 ctgaccgcc tcatcaccgc gaacaagcgg ggcgccccg caccggccac cgccgcgccc 14880
 gcgaagtggg cgaatgcctg agccctccgg agcgtcgtg aaatcctcgg ccggtggggc 14940
 gtccggtgc tgagaccact gaatgtccac ctacctgtg caggagctgg ttgtctcggg 15000
 gtccgggtc acctccgcca ttggccaggg ggccgcgtcc ttcacctcgg cgctcgtgga 15060
 gggcgcgga cggttccggg tgatggagcg gccggggcgt cagcatcagg ccaacgggca 15120
 10 gacgacggcc cacctggggg cggaaatcgc ctgcgtggcc gtgcccgaag gcgtcacccc 15180
 acaactgtgg cgctcggcca cgtttcggg gcaggccgca ctggtgaccg tccacgaggc 15240
 ctggaacgcg gcgcgcctcc aggccgtccc cggacaccgg attggattg tggtggggg 15300
 caccaacgtg cagcagcgcg acctggtgct gatgcaagac gcctatcgcg agcgggtgcc 15360
 cttctcggg gcggcctacg ggtcgacct catggacacc gacctcgtg gcctctcac 15420
 15 gcagcagttc gccatccacg ggatgtcct caccgtggga ggcgcacg ccagtggcct 15480
 gctggcggtc atccaggccg cggaggcgtg gctctcaaga agggtgagc ttgcatcgc 15540
 cgtgggggcg ctgatggacg tctctactg ggaatgccag ggcctgcggg ccatgggccc 15600
 gatgggcacc gaccggttcg cgcgggagcc ggagcgtgcc tgccggccct tcgaccggga 15660
 gagtatggc ttactcttg gagaggcgtg cggcgccgtg gtggtttagt ctgcggagca 15720
 20 cgctcggcga cgcgggggta ctctcgcgg catctgtcg ggctgggcca tgcagttgga 15780
 cgcgagccgc ggccggtgt cgtccatcga aggggagtcg cagggtattg gggctgcgt 15840
 gcggcacgcg gacctcgcg cggagcgggt ggactacgtg aatcctcacg gcagcggttc 15900
 gcgtcagggg gatgccatcg agctgggggc ctgaaggcg tgcggcctga cgcacgccc 15960
 ggtcaacacc acgaagtcca tcaccgggca tggctgtcc tcggcgggtg ccgtggggct 16020
 25 catgccacg ctggtccagt tggagcagg cggcgtcac ccgtcctga acctggtgga 16080
 cccgattgat tcatcgtcc gctgggtggg ggccaccgcg gaggccagt cctccagaa 16140
 cgcgctgtg ctgcctacg gctcggcg catcaacacc gctgtcgcg tgcgcggag 16200
 cgccacggag agctgacacg cccatgcaag ccgctcccc tccgaccgc gactaccaga 16260
 cgctccgggt ccgctcag ggcagacct ttttctcca gctccaccg ccggatgcg 16320
 30 acaacacat cagccgcacg ctgattgac agtgccagca ggtgctcac ttatgtagg 16380
 agcacgccac caccgtgtg ctgaaggcc tgccacacgt gttctgcat ggcgcggt 16440
 ttgagccat ccacgaccg gtcgacgac gccgccggga gcaaggcaac gcggagcagc 16500
 tgtaccggt gtggctgcaa ctggcgacag gccctacgt gacggtgcc catgtcagg 16560
 gcaaggccaa cgcgggcggc ctgggcttcg tcgccgctg cgacatcgt ctggcaaagg 16620
 35 cggaggcca gttcagtc tccgagctg tttcgggt gttccccg tcggtgatgc 16680
 cgttctcgc ccggcgaat gccatccagc ggcgcacta cctgacgct atgacgggc 16740
 ccatcgacgc ggccaggcg ctgagctggg ggtggcgga cgcggtggac gccgatagc 16800

C1

agaagctgtt gcggtccac ttgcgcaggc tgcggtgcct gtcgaagcca gcggtgaccc 16860
 agtacaagaa gtacgcctcc gagctggcg gccagctgt cgcgccatg ccccgggcca 16920
 tctccgcaa tgaggcgatg ttctccgacc gcgccacgt ggaagccatc catcgctacg 16980
 tggagacagg ccgactccca tgggaatcat gacggaagga acgccaatgg cgccggtgt 17040
 5 cagctccat gaggtggagg agggggtggc gcagatcacc ctggtggatc gcgagaacaa 17100
 gaacatgtt agcgagcagc tcgtgcgca gctcatcacc gtgtcggca aggtgaatgg 17160
 aaacgagcgc taccgcgcg tgggtctcac cggctacgac acctactcg cgctcggcg 17220
 gaccaaggcc ggcctgtgt ccatctgca cggcatcggc tcctcaacg tcaccaactt 17280
 ctacagctc gcgctggagt gcgacatccc ggtgattcc gccatcgagg gacatggcgt 17340
 10 aggcggcggg ttgcgatgg ggctgttcg ggactctgt gtctgagcc gggagagcgt 17400
 ctacacgagc aactcatgc gctacggctt cagccgggg atggcgcca cgtacatct 17460
 gccgaagcgg ctgggtact cgctcgggca tgagctctg ctcaacgcca ggaactaccg 17520
 cggcgccgac ctggagaagc gggcggtgcc ttctcgggtg ttcccgca aggaagtctt 17580
 gcccacgcc tacgagattg cgaggacct ggccgcgaaa cctcggtgt cgctcgtgac 17640
 C1 15 gctcaagcgg cacctgttc gcgacatccg ccgagagctt ccggacgtca tcgagcgtga 17700
 gctggagatg cagggcatca cctccatca cgacgacgtg aggaggcgca tcgagcagct 17760
 gttctctga ggcgcgccc tatgtgaac ctgatcaaca accacgcaca cggttatgtg 17820
 gtcacgccc tggctctggc ctgcaacgac gctggcctgt tcgaactct gcggcagga 17880
 ccgaaggact tcgaccggtt ggcgaggga ttgcgtgcca accggggaca tctgcgctc 17940
 20 gcgatgagga tgttgaatc gctcggctgg gttcccgcg acgcggatga cgtgtacgg 18000
 gtgacggcg cgcgccgc gcatcggtcc ttcccccg aggcgcagtc gctctcgcg 18060
 ctgcccattg accggtacct gcgcggggag gacggcctgt cctggcgcc gtggtcgag 18120
 cgctctcgg cgctgtgga taccgatgac acgctggtgc gcgagctgt cgacggcgcc 18180
 atcatcacgc cgctgatgt cgcgctggag cagcgtgggg gcctcaagga ggcgaggcgt 18240
 25 ctgtccgacc tgtgttcgg gggggatgga agggacagct gcgtccccga ggccgtcaa 18300
 cagagctgg ccgggtctt ctccgcgag aagtggacgc gtgaggacgc cgtcgacgcg 18360
 gagctcacgc ccaaggcgc ctctcttc gagcgggcat tgccttcgc catcgtcggc 18420
 tcgtaccggc cgatgtggc cagcatgccg cagctgtct tcggtgactg cgaccaggtc 18480
 ttggggcgg acgaagcgg ccacgaactg cacctggacc gaacctcaa cgtgattggg 18540
 30 agcgccacc agcaccgaa gtacttcgc gagctggaga agctcatcat caccgtctt 18600
 gatccgaga acctgtcgc acagccgcg tacatcgcg acatggggtg cgtgacggc 18660
 acgctctga agcgggtga tgaacggtg ctccgcaca cgcgcgggg aaggcgctc 18720
 gaccggttc cgctcacgt catcgccgc gacttcaac agaaggcgt cgaagccgt 18780
 gggcgacgc tggcgggtt ggagcacgt gccttcgcg cgacgtggc gcggccggac 18840
 35 cgtctcatg aggacctgc gcgcgcggg ctgaccgagc ctgagaatac gctgcacatc 18900
 cgctcgttc tcgaccagc ccgtccctac cagcctccg cgacagggc ggggtccac 18960
 gcccgattc cgttcgatt ggtgtcgtg ggcaaggcgg gccaggaggt ggttcggcg 19020

C1

gaggtgtcc acagcctggt ggagcacctc gag

19053
